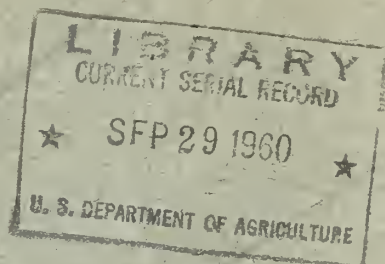


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Heights and Weights of Adults in the United States

Home Economics Research Report No. 10
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

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X **Heights and Weights of Adults**
in the United States X

by

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Human Nutrition Research Division,
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Heights and Weights of Adults in the United States

By MILICENT L. HATHAWAY, *nutrition specialist*, and ELSIE D. FOARD, *statistician*, Human Nutrition Research Division, Agricultural Research Service

This publication, which brings together data on heights and weights of adults, is a companion to "Heights and Weights of Children and Youth in the United States," Home Economics Research Report No. 2, issued by the U.S. Department of Agriculture. It has been prepared for reference use by research nutritionists and others concerned with long-range programs in nutrition, health, and education.

Height-weight relationships are important as one criterion of nutriture, although many other measurements are also considered informative of physical well-being. The most commonly used tables of desirable or expected weights for given heights of adults are those of the Metropolitan Life Insurance Company, first published in 1942 and 1943. These tables were derived primarily from data of the Association of Life Insurance Medical Directors and the Actuarial Society of America, collected between 1885 and 1908 in urban areas of eastern United States and Canada and first published in 1912. Compilation of more recent data, more representative of the total United States today, makes possible derivation of new tables to meet present-day needs.

The data included in this report cover a period of about 100 years. Aside from the insurance data referred to above and army data for men, few studies of heights and weights were published before 1920. Between 1920 and 1945 many studies were reported, particularly on younger women and for a wider geographical area. Since 1945 more data have been accumulated, a large proportion of which are published here in detail for the first time.

Particular mention might be made of two large blocks of unpublished data made available for tabulation and analysis. In 1950 the Research Committee of the American College Health Association, under

the chairmanship of Ramona Todd of the University of Minnesota, collected figures on heights, weights, and ages of about 160,000 students entering 104 colleges located in 34 States, the District of Columbia, and Ontario, Canada. The raw data as originally collected were made available through the courtesy of John Summerskill of Cornell University, Chairman of the Research Committee in 1956, and Ruth Boynton, of the University of Minnesota, in custody of the data. In this publication they will be referred to as the "ACHA Study."

Unpublished serial height-weight data from Smith, Vassar, Amherst, and Yale, height data on individual students at Vassar in 1958 and on their parents, and height-weight data collected as part of nutritional status studies have also been made available for this compilation.

All original unpublished data are coded as not published (n.p.) in the tables and in the Bibliography.

Also available for tabulation and analysis were height-weight data from about 7,500 families, collected as part of Household Food Consumption Surveys, in urban places in 1948, and in both urban and rural places in 1955, by the Household Economics Research Division of the U.S. Department of Agriculture. They will be referred to as the "1948 USDA Survey" and the "1955 USDA Survey."

This report is organized into five sections: Average heights and weights related to age; average weights for height and age; data on men in the military services; data from other countries compared with data from the United States; and changes in the United States population between 1790 and 1950. Also included is an addendum which presents new data made available as the manuscript was about to go to press.

SECTION I.—AVERAGE HEIGHTS AND WEIGHTS RELATED TO AGE

Data From the Literature and Unpublished Sources

Compiling data on heights and weights of adults from many sources was complicated by the variety of methods used in obtaining them. In some cases actual measurements were made of persons under various conditions of dress, in others estimates were reported by survey respondents of their own measurements and those of others in their families. In tables presenting data from more than one source, the methods used are indicated as follows: "a" indicates measured without clothing; "b", measured dressed in indoor clothing, without coats or vests for men, and without shoes; "c", measured in indoor clothing as in "b" but including shoes; "d", measured, but method of measurement not specified; "e", estimated values in indoor clothing, without shoes; and "f" estimates, dressed, but shoes not specified.

In order to compare data of the various types cited above, corrections for heights of heels and weights of clothes are needed. Unless such corrections were made by the authors at the time the individuals were measured, the corrected values can be only rough approximations, but without them consideration of changes in measurements over time are impossible.

The problem in making such corrections is that many changes in height of heels and weight of clothing have been made since the 1860's, when the earliest measurements reported here were made. Estimates in the literature do not agree, and little reliable information relating directly to specific periods seems to be available. We know that weight of indoor clothing before about 1920 differed markedly with the seasons. Since central heating has become general in this country much less difference is found between summer and winter indoor clothing. Fashion has played an important part in weight of clothing, particularly for women. Differences in the length and fullness of skirts, number and style of undergarments and types of fabrics used are examples of fashion changes affecting the weight of clothing.

The methods used in this publication for estimat-

ing the necessary corrections, are based on the following data for heights of heels and weights of clothing found in the literature:

Height of heels for men are generally estimated as 1 inch. See Hrdlicka (1925), Kemsley (1950), Interdepartmental Committee on Nutrition for National Defense (1957), and Metropolitan Life Insurance Company's tables of desirable weights (1958). Estimates of height of heels for women show no such uniformity. Hrdlicka (1925) used 1 inch, Bayer and Gray (1934) 2 inches, Kemsley (1950) 1½ inches, and Metropolitan Life Insurance Co. (1958) 2 inches. Observation of women's shoes in 1959 shows heels vary from 0 to 3 inches or more in "flats" to pumps with 3½ inch spike heels.

Weights of clothing have varied widely over the years. Gould (1869) reported that the average weight of a pair of trousers was 1.57 pounds (based on weight of 24 pairs) and underwear, consisting of "woolen shirts, drawers and stockings", 1.64 pounds. Weights of other clothing were not given. Symonds (1908) estimated that the clothing for a 67-inch man was 6 to 7 pounds in summer, 12 to 14 pounds in winter. Presumably these estimates included shoes. The Association of Life Insurance Medical Directors (1912) and Gray and Gray (1917) gave only comparative values, stating that men's winter clothing weighed 5 or 6 pounds more than summer clothing. Half the data for the 1912 medico-actuarial study were for winter and half for summer measurements. Hrdlicka (1925) estimated men's clothing as 8 pounds for the 1912 actuarial study. Harris and Benedict (1919) gave an estimate of 9 pounds; Gray and Mayall (1920), of 7 to 9 pounds.

The Interdepartmental Committee on Nutrition for National Defense (1957) has proposed a table of standard weights for men of different statures and ages based on the medico-actuarial tables, adjusted to weight without clothing by subtracting 5 pounds and 1 inch from each height-weight-age category. (This weight of clothing corresponds more to present day clothing weights than to those of the 1890's, when most of the measurements were made.) In more recent studies Pett and Ogelvie (1956) in Canada reported an average of 2 to 3 pounds as weight for men's clothing (without shoes), and Pemberton and Macleod (1956) in Massachusetts found men's clothing to average 3 pounds.

Women's clothing, too, has varied in weight over the years. No estimate has been found for the early medico-actuarial study of 1912. The estimate given by Harris and Benedict (1919) was 5.5 pounds, Bayer and Gray (1934) 4 pounds, Pett and Ogelvie (1956) 2 to 3 pounds.

In this compilation, data in tables are generally reported as published. In tables or charts in which comparisons of data from a number of studies are

presented, reductions in reported measurements have been made as follows:

1. One inch for men's and 2 inches for women's heels.
2. Seven to 10 pounds for men's clothing and 5 to 7 pounds for women's clothing for the medico-actuarial study of 1912.
3. Three to 5 pounds for men's clothing and 2 to 3 pounds for women's clothing for data of 1930 or later.
4. In Metropolitan Life Insurance Co. tables of "desirable" weights (see table 38) and that of the Equitable Life Assurance Society (see table 40) the values for men's weights as given are considered comparable to nude

values, because subtracting 1 inch in height gives a reduction of 3 to 5 pounds in weight depending on height, and this is equivalent to the weight of clothing. For women, deduction of 2 inches for heel heights would reduce the weights given in tables 38 and 41 by 3 to 7 pounds (depending on the height) which is nearly double the weight of usual clothing. Therefore using the intermediate value of 2 to 3 pounds (equivalent to a 1 inch heel) would give a weight more comparable to weight without clothing.

Average heights and weights of adults from various studies, published and unpublished, from 1857 to 1958, are presented in tables 1-7. All original data

TABLE 1.—MEN: *Average heights and weights before 1925*

Origin of data	Date of study	Age	Cases	Height	Weight	How measured ¹	First author and date of publication
		<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>		
Citadel Academy (S.C.)-----	1857	18.5	89	67	134	c	Dickson 1857, 1858, 1866.
Jefferson Medical College (Pa.).	1857	22	75	69 +	145 +	c	
South Carolina Medical College.	1857	21	141	69 +	145.2	c	
University of Louisiana-----	1857	24.3	42	70.2	145.2	c	
University of Michigan-----	1857	24.5	53	68.8	150.8	c	
University of Tennessee-----	1857	24.5	108	70	150.2	c	
Virginia Military Institute--	1857	18.5	150	69	141.2	c	
West Point-----	1857	20.1	211	69	143.1	c	
Jefferson Medical College:							
Men from Northeast---	1865	24.7	156	68.2	147.0	c	
Men from North Central.	1865	25.3	45	69.3	149.9	c	Lee 1866-67.
Men from South-----	1865	24.6	76	70.2	155.7	c	
U.S. Senators-----	1866	52	50	70.5	171.2	c	
Boston-----	1875	16	359	65.0	121.0	b	Bowditch 1877.
	1875	17	192	66.2	127.5	b	
"College data"-----	1875	18	84	66.7	132.6	b	Sargent 1889.
	<1889	16-26	2,235	67.7	135.1	a	
Chicago-----	1899-1900	16	122	66.1	123.0	b	Christopher 1900.
	1899-1900	17	78	66.3	130.5	b	
	1899-1900	18-20	52	68.3	143.2	b	
Columbia College-----	1907	17-19	790	67.5	130.1	a	Meylan 1908.
Harvard Medical School---	1910-15	20-29	76	68.3	140.9	a	West 1920.
	1910-18	20-24	59	68.0	142.9	a	
	1910-18	25-29	33	67.9	135.9	a	
Boston-----	1910-18	30-39	22	68.4	143.8	a	Harris 1919.
	1910-24	24-29	83	68.7	146.6	b	
	1910-24	30-39	62	68.9	158.6	b	
"Old Americans"-----	1910-24	40-49	42	68.7	156.5	b	Hrdlicka 1925.
	1910-24	50-59	32	68.2	159.8	b	
	1911-13	18.8	1,243	69.0	139.3	a	
Princeton University-----	1911-13	18.8	1,243	69.0	139.3	a	Raycroft cited in Hrdlicka 1922, 1925.
East and North Central U.S.	1914-21	20-60	2,693	67.9	-----	c	
Amherst College-----	1915	18.8	119	68.8	135.9	a	Britten 1926.
Ohio Wesleyan-----	1915	19.4	175	67.9	137.8	a	
Princeton University-----	1915	18.7	-----	69.0	140.4	a	Marsh n.p.
Wesleyan (Conn.)-----	1915	-----	-----	68.1	136.5	a	
Wooster College (Ohio)-----	1915	19.9	70	68.6	137.4	a	
Yale University-----	1915	19.2	-----	68.9	142.3	a	

¹ a, without clothing; b, in indoor clothing without shoes; c, in indoor clothing including shoes.

TABLE 2.—WOMEN: *Average heights and weights before 1925*

Origin of data	Date of study	Age	Cases	Height	Weight	How measured ¹	First author and date of publication
		<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>		
Laurens (S.C.)-----	1857	14.1	52	60.0	100.2	c	Dickson 1858.
Limestone Spring (S.C.)----	1857	14.9	75	61.7	-----	c	
	1875	16	353	61.6	112.0	b	Bowditch 1877.
Boston-----	1875	17	233	61.9	115.5	b	
	1875	18	155	62.0	115.2	b	Bowditch 1890.
Boston-----	1881-85	17-24	1,105	62.5	124.6	b	
"College data"-----	<1889	16-26	1,835	62.6	114.6	a	Sargent 1889.
Wellesley College-----	<1893	19.1	1,500	² 63.2	² 119.4	a	Wood
Oberlin College-----	<1894	19.3	1,600	² 62.6	² 112.4	a	Hanna cited in Seaver,
University of Nebraska-----	<1899	-----	1,500	² 63.8	² 114.0	a	Clapp } 1909.
Chicago-----	1899-1900	16-20	630	62.9	115.0	b	Christopher 1900.
Boston-----	1910-15	20-29	40	64.4	128.6	a	West 1920.
	1910-18	20-29	55	63.6	119.3	a	Harris 1919.
Boston-----	1910-18	30-39	13	64.1	124.4	a	
	1910-18	40-49	7	65.0	152.6	a	
	1910-18	50-59	10	63.7	143.8	a	
	1910-24	24-29	71	64.0	123.4	b	Hrdlicka 1925.
"Old Americans"-----	1910-24	30-39	70	63.7	127.5	b	
	1910-24	40-49	34	64.1	143.9	b	
	1910-24	50-59	26	62.6	138.1	b	Hutchins cited by Hrdlicka 1925.
Berea College (Ky.)-----	1921-22	19.3	176	63.2	-----	b	

¹ a, without clothing; b, in indoor clothing without shoes; c, in indoor clothing including shoes.² 50th percentile.TABLE 3.—MEN AND WOMEN: *Average heights and weights, medico-actuarial data, 1885-1908* ¹

Age in years	Men: 1885-1900			Women: 1885-1908		
	Cases	Height	Weight	Cases	Height	Weight
	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
20-24-----	34,293	68.4	148.2	22,187	64.4	127.9
25-29-----	49,709	68.5	152.6	31,300	64.4	130.5
30-34-----	46,299	68.6	156.7	28,251	64.3	133.9
35-39-----	36,217	68.5	160.1	21,391	64.3	137.4
40-44-----	23,941	68.5	162.2	13,406	64.1	140.7
45-49-----	13,700	68.3	164.4	8,117	64.0	143.1
50-54-----	7,406	68.5	165.5	4,570	63.8	145.0
55-59-----	3,609	68.4	165.3	1,995	63.6	145.0
60-64-----	1,144	68.4	165.3	576	63.5	143.9
65+-----	265	68.5	166.0	112	63.1	138.2

¹ Source: Assoc. Life Insurance Medical Directors and Actuarial Society of America (1912); Measurements include shoes and other indoor clothing.

are coded in the tables and bibliography as not published (n.p.). Tables 1 and 2 give data primarily on young men and women averaging under 25 years of age from various school and college studies from 1857 to 1924. Table 3 presents medico-actuarial data collected from 1885 to 1908, covering ages 20 to 65 years and over. All the data in these three tables represent measurements of persons living east of the Mississippi River, and most of them from States

along the eastern seaboard. They were primarily of "American" parentage and British ancestry.

The earliest reports, those of Dickson (1857, 1858, and 1866) and Lee (1866-67), emphasized the tallness of the men in their studies. Dickson stated that "We of the Atlantic Southern States do not by any means claim to be as tall as our Kentucky, Tennessee, and Mountain Virginia brothers; but if the newspapers tell the truth, the tallest man now

in the Army is a Georgian, and the next a South Carolinian." Lee stated that the heights of the U.S. Senators in 1866 "Exceed the average of mankind in all parts of the world as well as the average of our own country." The percentages of men 72 inches and over reported in their studies were high. Even allowing an inch for shoes, 28 percent of the U.S. Senators were 72 to 74 inches tall, and the proportion of tall men measured in the southern colleges was greater than is reported later (table 18) for men from Amherst College in Massachusetts at the same period.

Data in table 1 show that the average height of young men measured without shoes was usually from 66 to 68 inches. Although Amherst, Princeton, and Yale students in 1915 averaged about 69 inches, and some of those from southern colleges also averaged this tall, men from a more general sampling (table 3) averaged about 67.5 inches when data were corrected for heel heights.

The earliest heights reported for college women aged 16 years and over averaged 62 to 63 inches (table 2). Medico-actuarial data (table 3) averaged 61 to 62 inches, allowing 2 inches for heel heights.

In tables 4 and 5 are reported average heights and

weights of men and women 16 to 21 years of age, related to region and time of measurements. Regional classification of States is that used in census reports (figure 1). Most of the data are on college students, although some data on high school students from the report on children and youth have been included (Hathaway 1957). In tables 4 to 7 the year 1945 was used as a dividing line between early and recent studies. Passage of the Agricultural Research and Marketing Act of 1946 stimulated investigations of nutritional status and consequently measurements of persons who were included in the studies. Many of these recent data, although unpublished, have been made available to us for use in this publication.

As seen in table 4, men measured before 1945 who had average heights over 69 inches were from private schools or colleges. Of those measured since 1945, few averaged below 69 inches and many were 69.5 inches or over. In many studies men at 18 years of age averaged as tall as men 21 years old from the same study. Average weights of men generally increased slightly from age 18 to 21 years, as might be expected, since weights usually lag somewhat during the years of rapid growth in height.

Table 5 shows that women measured before 1945

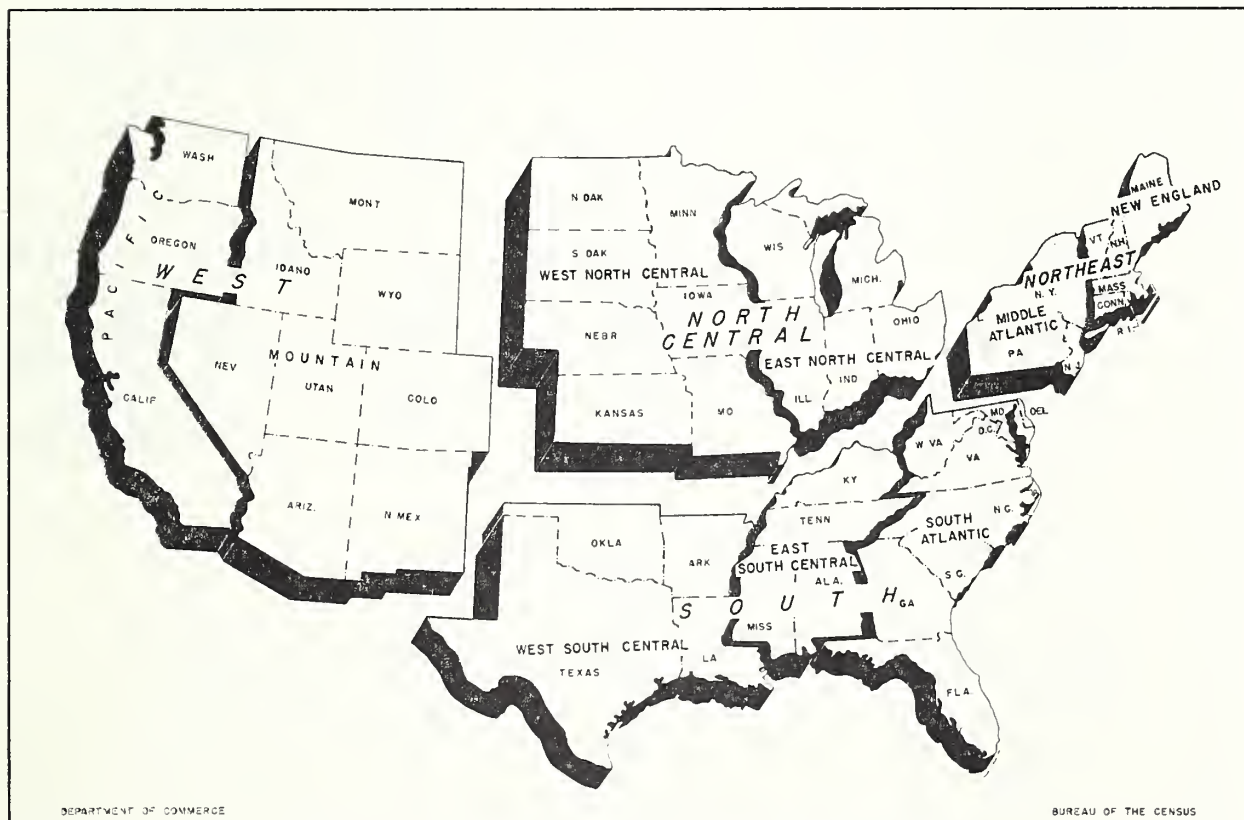


FIGURE 1.—Regions and geographic divisions of the United States.

TABLE 4—MEN, AGED 16–21 YEARS: *Average heights and weights by single years of age, region, date of measurement, and source of data, 1920–55*
 [Bold face letters following references indicate how data were secured: a, persons measured without clothing; b, measured in indoor clothing except shoes; c, measured in indoor clothing including shoes; d, measured, but dress not specified; e, estimated values, in indoor clothing except shoes; f, estimated values in indoor clothing, shoes not specified.]

DATA COLLECTED BEFORE 1945

Age in years	Northeast			North Central			South			West			All United States			Age in years		
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight			
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds			
	New York in 1920's (Schwartz 1928) a												Citizens Army Training Camp in 1920's (Berkson 1929) a					
16	90	66.9	126.3										3,983	66.9	128.1	16		
17	54	68.0	131.0										28,727	67.4	130.8	17		
18	41	68.0	134.8										31,709	67.8	134.4	18		
19	36	68.0	139.6										19,197	68.1	137.7	19		
20													10,591	68.1	139.8	20		
21													5,941	68.2	140.9	21		
	Massachusetts in 1920-34 (Shuttleworth 1939) b						Iowa in 1920-34 (Meredith 1935) a						N.E., N.C., West, in 1926-30 (Gray 1931) a					
16	684	66.3	128.6	337	66.8	128.7				1,308	67.3	133.1	292	68.0	133.6	16		
17	587	67.5	136.9	284	68.3	137.6				1,148	68.1	138.4	229	69.0	141.8	17		
18	277	68.1	143.1	216	68.6	142.6				594	68.5	140.2	129	69.4	145.7	18		
19	62	68.4	146.9							191	67.5	142.9	52	69.4	148.0	19		
20	6	68.7	151.3							75	66.8	130.5				20		
	4 colleges in 1928-30 (Diehl 1933a) a						3 colleges in 1928-30 (Diehl 1933a) a						Texas University in 1928-30 (Diehl 1933a) a					
16	341	66.6	132.0	49	68.1	135.9	139	68.6	135.8	81	68.9	135.8	610	67.5	133.7	16		
17	1,442	67.9	136.7	619	68.4	137.5	550	68.9	138.7	633	69.1	141.6	3,244	68.4	138.2	17		
18	3,235	68.6	140.7	2,212	68.5	140.0	724	69.1	142.7	1,197	69.2	142.8	7,368	68.7	141.1	18		
19	2,921	68.9	142.6	1,913	68.5	141.3	559	69.1	142.9	914	69.0	143.7	6,311	68.8	142.4	19		
20	1,357	68.8	144.4	1,226	68.4	142.6	338	69.0	144.8	686	69.3	145.7	3,613	68.8	144.0	20		
21	487	68.6	144.7	767	68.4	143.1	226	68.9	144.9	536	69.1	146.9	1,976	68.8	144.9	21		
	Illinois in 1930-36 (Richey 1937) a						Maryland in 1937-40 (Wolff 1941, 1942) b						California in 1936-38 (Lloyd-Jones 1940, 1941) a					
16				231	67.8	127.7	339	66.6	133.0	4,182	67.2	131.9				16		
17				150	68.8	135.1	186	68.0	139.0	3,198	68.1	138.1				17		

18-----	49	69.7	139.3	79	67.8	143.1	1,607	68.6	141.8	-----18
19-----	-----	-----	-----	27	68.0	146.0	-----	-----	-----	-----19
20-----	-----	-----	-----	14	68.9	154.6	-----	-----	-----	-----20
DATA COLLECTED AFTER 1945										
Massachusetts in 1946-51 (Condron n.p.) a	Iowa in 1948-51 (Eppright 1954) a		California in 1945-47 (Tuddenham 1954) a		87 colleges in 1948-50 (ACHA Study n.p.) a					
-----	34	67.1	140.3	-----	66	69.2	145.3	-----		
16-----	98	69.4	157.2	-----	66	70.0	151.5	-----16		
17-----	342	69.8	160.4	-----	66	70.5	154.8	-----17		
18-----	329	69.7	163.8	-----	-----	-----	-----	-----18		
19-----	408	69.7	165.2	-----	-----	-----	-----	-----19		
20-----	370	69.8	164.7	-----	-----	-----	-----	-----20		
21-----	-----	-----	-----	-----	-----	-----	-----	-----21		
25 colleges in 1948-50 (ACHA Study n.p.) a	35 colleges in 1948-50 (ACHA Study n.p.) a		17 colleges in 1948-50 (ACHA Study n.p.) a		10 colleges in 1948-50 (ACHA Study n.p.) a					
-----	100	69.2	150.2	-----	34	69.1	150.3	-----		
16-----	2,313	69.5	152.7	135	68.7	142.6	431	69.0	146.8	-----16
17-----	6,122	69.6	153.8	1,730	69.6	149.7	8,177	69.6	151.7	-----17
18-----	2,757	69.6	155.6	4,079	69.6	151.4	26,359	69.7	153.3	-----18
19-----	1,629	69.5	157.7	2,432	69.6	152.7	13,333	69.6	154.5	-----19
20-----	1,572	69.2	157.4	1,859	69.6	154.1	9,566	69.6	155.6	-----20
21-----	-----	-----	-----	1,642	69.6	154.0	8,558	69.5	156.3	-----21
New York in 1949-50 (Young, n.p.) a	S.E. Michigan in 1954 (Martin 1955) b		West Virginia in 1948-52 (Lawless n.p.) d		Montana in 1950-51 (Odland n.p.) b					
-----	177	67.9	142.3	-----	-----	-----	-----	-----		
16-----	40	69.1	146.1	27	70.9	165.7	42	70.4	154.7	-----16
17-----	91	69.3	149.5	35	70.2	159.3	161	69.8	156.1	-----17
18-----	39	69.4	150.3	36	70.5	162.7	46	69.7	154.9	-----18
19-----	32	69.0	159.7	31	69.5	168.2	12	69.6	169.4	-----19
20-----	18	69.1	157.6	-----	-----	-----	8	70.0	157.1	-----20
21-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----21
Survey in 1955 (USDA n.p.) e	Survey in 1955 (USDA n.p.) e		Survey in 1955 (USDA n.p.) e		Survey in 1955 (USDA n.p.) e					
-----	25	67.6	144.2	50	67.8	139.9	16	69.4	146.1	-----16
16-----	30	68.8	147.7	37	68.4	144.3	16	69.7	163.9	-----17
17-----	26	68.8	158.1	42	68.9	151.0	9	70.1	160.8	-----18
18-----	18	69.2	156.2	27	69.2	155.9	2	67.5	170.0	-----19
19-----	11	69.9	156.6	28	69.3	156.9	4	70.2	149.7	-----20
20-----	14	68.2	170.5	29	69.3	158.7	14	69.6	154.4	-----21
21-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

TABLE 5.—WOMEN, AGED 16-21 YEARS: *Average heights and weights by single years of age, region, date of measurement, and source of data, 1920-55*
 [Bold face letters following references indicate how data were secured: a, persons measured without clothing; b, measured in indoor clothing except shoes; c, measured in indoor clothing including shoes; d, measured, but dress not specified; e, estimated values, in indoor clothing except shoes; f, estimated values in indoor clothing, shoes not specified.]

DATA COLLECTED BEFORE 1945

Age in years	Northeast			North Central			South			West			All United States			Age in years
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	
	Massachusetts in 1923-28 (Gordon 1930) a			Ohio in 1926-27 (McKay 1930) a			Louisiana in 1909-28 (Gould 1930) a			California in 1920-23 (Pasmore 1924) a			N.E., N.C., West in 1926-30 (Gray 1931) a			
16-----	73	64.6	130.0	20	63.0	116.8	159	63.4	117.5	10	63.1	120.6	8 colleges in 1928-30 (Diehl 1933b) a			16-----
17-----	315	64.7	126.0	32	63.8	121.3	723	63.4	115.8	48	63.8	118.1				17-----
18-----	426	64.7	121.0	15	64.6	129.4	719	63.2	117.0	103	63.3	121.9				18-----
19-----	164	64.5	126.0	---	---	---	260	63.4	115.7	106	63.5	120.5				19-----
20-----	95	64.6	127.8	---	---	---	---	---	---	73	63.8	123.2				20-----
21-----	315	64.8	126.0	---	---	---	---	---	---	46	63.7	123.2				21-----
	Massachusetts in 1922-34 (Shuttleworth 1939) b			Iowa in 1920-35 (Boynton 1936) a			South Carolina in 1929-30 (Remington 1931) d			Arizona in 1923 (Gittings 1927) a			8 colleges in 1928-30 (Diehl 1933b) a			
16-----	665	62.5	117.4	183	63.5	120.0	---	---	---	7	64.6	121.4	Stanford Univ. in 1928-30 (Diehl 1933b) a			16-----
17-----	553	62.7	119.5	166	63.5	119.7	---	---	---	24	63.2	115.5				17-----
18-----	240	62.8	120.7	111	63.4	120.3	9	64.1	130.7	27	62.9	117.4				18-----
19-----	48	62.9	126.3	---	---	---	20	64.8	125.7	8	64.1	126.1				19-----
20-----	---	---	---	---	---	---	19	63.4	118.2	6	64.0	111.0				20-----
21-----	---	---	---	---	---	---	16	63.3	123.0	---	---	---				21-----
	2 colleges in 1928-30 (Diehl 1933b) a			3 colleges in 1928-30 (Diehl 1933b) a			2 colleges in 1928-30 (Diehl 1933b) a			Stanford Univ. in 1924-34 (Barker 1936) a			8 colleges in 1928-30 (Diehl 1933b) a			
16-----	143	63.7	124.4	164	63.4	121.9	379	64.0	118.7	16	64.4	123.1	Stanford Univ. in 1924-34 (Barker 1936) a			16-----
17-----	1,048	63.8	124.3	1,089	63.4	120.6	1,429	63.8	115.6	110	64.1	123.1				17-----
18-----	1,996	63.8	123.4	2,215	63.5	120.8	1,413	63.6	116.3	277	64.5	125.0				18-----
19-----	1,250	63.9	123.5	1,364	63.6	120.6	811	63.8	116.7	412	64.4	123.4				19-----
20-----	428	63.7	122.9	790	63.6	124.6	349	64.2	118.1	382	64.5	123.7				20-----
21-----	97	63.8	124.2	518	63.5	121.1	170	63.6	115.4	273	64.4	121.9				21-----
	Pembroke College in 1927 (Carter 1932) a			Univ. Tennessee in 1930 (Carter 1932) a			Univ. Tennessee in 1930 (Carter 1932) a			Stanford Univ. in 1924-34 (Barker 1936) a			8 colleges in 1928-30 (Diehl 1933b) a			
16-----	5	62.8	---	---	---	---	---	---	---	---	---	---	8 colleges in 1928-30 (Diehl 1933b) a			16-----
17-----	5	62.9	---	---	---	---	8	64.1	---	331	64.8	124.8				17-----
18-----	23	64.1	---	---	---	---	39	63.4	---	783	64.7	124.0				18-----

19-----	28	65.1	-----	Boston in 1931-33 (Talbot 1937) d	49	63.5	-----	Wyoming Univ. in 1934-35 (McKerrick 1936) d	718	64.8	125.1	19-----	
20-----	15	63.4	-----		32	64.1	-----		474	64.8	123.9	20-----	
21-----	13	64.5	-----		20	64.2	-----		210	64.6	122.9	21-----	
16-----	20	65.4	134.4	5 colleges in 1936-39 (Donelson 1940) a	6	62.8	114.0	California in 1936-38 (Lloyd-Jones 1940, 1941) a	6	63.7	133.6	16-----	
17-----	15	65.0	131.7		14	64.6	124.6		7	65.3	131.4	17-----	
18-----	5	64.1	122.4		15	64.3	120.4		20	63.6	121.3	18-----	
19-----					14	64.3	121.4		24	64.1	125.0	19-----	
20-----				Nebraska in 1937-40 (Leverson 1942) a	178			Maryland in 1937-40 (Wolff 1941, 1942) a	24	64.1	125.0	20-----	
21-----					75	64.7	129.2		3	64.1	129.4	21-----	
16-----				Arizona in 1940-47 (Thompson 1948) b	319	62.8	117.6	California in 1945-47 (Tuddenham 1954) a	4,761	63.7	117.8	16-----	
17-----					193	63.3	118.8		3,482	63.8	119.2	17-----	
18-----					88	63.0	119.2		1,716	63.7	119.6	18-----	
19-----					18	63.3	121.7					19-----	
20-----											20-----		
21-----											21-----		
DATA COLLECTED AFTER 1945													
17-----	Iowa in 1948-51 (Eppright 1954) a				California in 1945-47 (Tuddenham 1954) a				California in 1945-47 (Tuddenham 1954) a				
18-----	37				63.2				70				
19-----	26				64.0				70				
20-----	10				63.9				70				
21-----					126.1				65.3				
					126.8				65.4				
					119.2				65.6				

TABLE 5.—WOMEN, 16-21 YEARS: Average heights and weights by single years of age, region, date of measurement, and source of data, 1920-55—Con.

Age in years	Northeast			North Central			South			West			All United States			Age in years
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	
	Rhode Island in 1948-51 (Tucker n.p.) ^d			Nebraska in 1947-50 (Leverson n.p.) ^a			West Virginia in 1948-51 (Lawless n.p.) ^d			Montana in 1950-51 (Odland n.p.) ^b			88 colleges in 1948-50 (ACHA Study n.p.) ^a			
16	37	63.7	127.9													16
17	24	64.5	128.3										29	65.1	133.9	17
18	47	64.2	123.4										103	65.1	121.7	18
19	31	63.8	125.5	20	63.8	125.2	18	64.5	123.9				9	65.1	133.8	19
20	21	63.5	127.0	24	65.0	128.1	26	65.3	124.8							20
21	9	62.9	126.0	29	65.4	128.1	32	64.4	118.2							21
				15	65.0	125.9	38	64.9	122.7							
	25 colleges in 1949-50 (ACHA Study n.p.) ^a			34 colleges in 1948-50 (ACHA Study n.p.) ^a			18 colleges in 1949-50 (ACHA Study n.p.) ^a			11 colleges in 1949-50 (ACHA Study n.p.) ^a			88 colleges in 1948-50 (ACHA Study n.p.) ^a			
16	191	64.2	127.5	163	64.4	129.1	178	64.0	121.6	63	65.1	131.1	595	64.3	126.5	16
17	2,610	64.4	127.8	2,332	64.4	125.8	1,570	64.3	121.7	1,333	64.8	125.9	7,845	64.4	125.7	17
18	4,975	64.5	126.9	8,678	64.4	125.1	3,292	64.4	121.5	2,888	64.8	124.9	19,833	64.5	124.9	18
19	1,843	64.6	126.6	3,584	64.4	124.9	1,990	64.4	121.9	1,278	64.9	126.2	8,695	64.5	124.8	19
20	1,267	64.6	127.4	2,053	64.5	125.7	1,024	64.3	121.8	1,013	64.9	126.2	5,357	64.6	125.5	20
21	1,224	64.7	127.5	1,067	64.6	126.2	456	64.4	122.2	552	64.8	125.2	3,299	64.6	125.9	21
	Michigan in 1954 (Martin 1955) ^b			Florida in 1950-56 (Cate n.p.) ^d			Texas in 1947-57 (Scouler n.p.) ^d									
16	184	63.9	124.5													16
17	156	64.1	125.8	41	66.5	137.4	9	65.6	127.9	3	63.7	121.7	30	65.0	135.0	17
18	131	64.4	126.8	31	67.0	137.7	31	67.0	137.7	69	64.3	136.2	69	64.3	136.2	18
19				74	65.3	124.9	74	65.3	124.9	48	64.9	126.1	48	64.9	126.1	19
20							54	65.5	128.9	27	64.6	127.7	27	64.6	127.7	20
21																21
	Survey in 1955 (USDA n.p.) ^e			Survey in 1955 (USDA n.p.) ^e			Survey in 1955 (USDA n.p.) ^e			Survey in 1955 (USDA n.p.) ^e			Survey in 1955 (USDA n.p.) ^e			
16	27	63.8	119.0	46	64.1	121.8	46	63.7	114.6	16	63.5	115.6	135	63.8	118.1	16
17	23	63.7	121.2	35	64.3	122.0	34	63.4	119.1	15	64.1	121.7	106	63.9	120.9	17
18	22	64.5	124.2	29	64.9	123.7	33	63.3	122.9	7	64.2	123.7	92	64.2	123.7	18
19	28	63.1	122.1	14	64.9	121.1	36	64.7	121.1	11	64.0	120.5	89	64.2	121.7	19
20	23	63.2	125.5	26	64.0	124.4	26	64.3	124.3	12	63.3	122.3	86	63.8	124.4	20
21	17	63.5	122.6	28	65.0	126.7	26	64.5	124.1	7	64.2	134.3	79	64.4	125.6	21

¹ About 22 percent from Oklahoma (South).

TABLE 6—MEN, AGED 20 YEARS AND OVER: *Average heights and weights by 5- or 10-year age groups, region, date of measurement, and source of data, 1920-55*

[**Bold face** letters following references indicate how data were secured: **a**, persons measured without clothing; **b**, measured in indoor clothing except shoes; **c**, measured in indoor clothing including shoes; **d**, measured, but dress not specified; **e**, estimated values, in indoor clothing except shoes; **f**, estimated values in indoor clothing, shoes not specified.]

DATA COLLECTED BEFORE 1945																
Age in years	Northeast			North Central			South			West			All United States			
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	
	New York in 1920's (Schwartz 1928) a			Illinois in 1927-29 (Gray 1934-35) a			Virginia in 1918-30 ¹ (Bean 1931) b									
20-24	206	68.0	142.4	}	281	67.5	145.0	594	68.2	---						
25-29	196	68.2	146.0					493	68.3	---						
30-39	151	67.9	153.2		155	67.0	146.2	188	68.0	---						
40-49	86	67.5	157.3		93	66.5	152.2	92	68.2	---						
50-59	---	---	---	46	66.6	157.1		66	68.0	---						
60+	---	---	---	19	65.4	150.8		22	68.3	---						
	New York in 1934 (Lewis 1938) a															
40-49	20	68.3	153.2													
50-59	20	68.1	152.6													
60-69	20	67.6	150.8													
70-79	20	65.8	149.3													
80-101	23	66.0	134.9													
DATA COLLECTED AFTER 1945																
	Springfield in 1946-51 (Condron n.p.) a															
20-24	1,661	69.7	165.6													
25-29	394	69.5	165.7													
30-34	47	69.7	166.0													

20-24
 25-29
 30-39
 40-49
 50-59
 60+

40-49
 50-59
 60-69
 70-79
 80-101

20-24
 25-29
 30-34

TABLE 6—MEN, AGED 20 YEARS AND OVER: Average heights and weights by 5- or 10-year age groups, region, date of measurement, and source of data, 1920-55—Continued

Age in years	Northeast			North Central			South			West			All United States			Age in years
	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	
	25 colleges in 1949-50 (ACHA n.p.) a			35 colleges in 1948-50 (ACHA n.p.) a			17 colleges in 1949-50 (ACHA n.p.) a			10 colleges in 1949-50 (ACHA n.p.) a			87 colleges in 1948-50 (ACHA n.p.) a			
20-24	6,121	69.3	157.9	15,613	69.5	156.8	6,755	69.6	154.3	7,184	69.6	155.9	35,673	69.5	156.3	20-24
25-29	1,447	69.2	159.9	4,829	69.3	158.9	2,314	69.4	156.4	3,728	69.4	157.9	12,318	69.3	158.3	25-29
30-34	249	68.8	158.7	1,273	69.0	160.8	510	69.3	160.5	1,124	69.2	159.9	3,156	69.1	160.3	30-34
35-39	64	67.7	158.7	383	68.9	164.7	107	69.4	161.4	391	68.8	160.5	945	68.8	162.2	35-39
40+	20	68.4	163.1	249	68.3	163.5	49	69.4	162.3	251	68.2	163.7	569	68.4	163.5	40+
	New Jersey in 1948-41 (Babcock n.p.) d			Nebraska in 1948-51 (Levertton n.p.) b			Virginia in 1950 (Abraham n.p.) c			Montana in 1950-51 (Odland n.p.) b			Urban survey in 1948 (LSDA n.p.) d			
20-24	42	69.2	152.6				1,053	69.4	153.0	31	69.5	162.1	133	69.3	159.1	20-24
25-29	118	68.1	163.3		71.2	163.0	1,405	69.3	162.7	11	69.9	163.5	161	69.5	164.0	25-29
30-34	153	68.6	169.5		69.2	165.8	1,273	69.1	165.4				194	69.6	168.9	30-34
35-39	116	68.2	170.0		69.2	151.5	1,225	68.9	167.7	California in 1948-49 (Gillum n.p.) b			191	69.3	167.4	35-39
40-44	72	67.2	162.2		68.9	172.4	1,035	68.6	169.0				181	68.8	163.9	40-44
45-49	39	67.0	160.6		69.2	189.0	858	68.4	171.1				156	68.4	165.7	45-49
50-54	29	67.2	171.1				685	68.2	167.5				159	67.9	163.0	50-54
55-59	15	66.4	158.3				528	67.8	167.1				123	68.0	163.3	55-59
60-64	15	65.9	151.0										98	68.1	162.0	60-64
65-69													74	67.6	159.6	65-69
70-74													75	68.3	163.9	70-74
75-79																75-79
80-95																80-95
										Colorado in 1949-50 (Dyar n.p.) b						
50-59																50-59
60-69																60-69
70-79																70-79
80-89																80-89
	Massachusetts in 1955 (Macleod n.p.) a			Minnesota in 1954-55 (Brozek n.p.) a			California 1958 (Wennesland 1959) a									
19-24																19-24
25-29				51	69.4	164.2				18	66.6	156.2	42	70.0	157.6	25-29
										29	66.9	152.5	76	69.5	157.8	
										23	66.6	143.4				
										7	65.6	147.7				

30-34	4	69.2	198.6	90	69.1	166.0	}	45	69.1	158.7	30-34
35-39	154	68.6	173.3	97	69.7	173.9		22	69.3	160.3	35-39
40-44	110	68.3	170.5	141	69.3	176.8		11	68.7	167.8	40-44
45-49	95	68.1	167.8	95	69.0	171.5		5	68.9	166.7	45-49
50-54	77	68.3	174.6	88	68.5	173.7					50-54
55-59	65	66.8	165.1	91	68.8	171.5		888	67.6	160.0	55-59
60-64	34	67.5	168.9	---	---	---					60-64
65-69	15	67.3	157.6	---	---	---					65-69
70-74	7	65.8	153.9	---	---	---					70-74
75-79	6	68.3	165.0	---	---	---					75-79
80-84	---	---	---	---	---	---	377	67.3	149.8	80-84	
85-89	---	---	---	---	---	---	521	67.5	157.8	85-89	
90-94	---	---	---	---	---	---	313	67.7	148.4	90-94	
95-106	---	---	---	---	---	---	120	67.2	139.3	95-106	
---	---	---	---	---	---	---	24	66.0	147.1	---	

¹ Age groups were 21-25, 26-30, 31-40, 41-50, 51-60.

24 colleges in 1949-50 (ACHA Study n.p.) a	34 colleges in 1948-50 (ACHA Study n.p.) a	18 colleges in 1949-50 (ACHA Study n.p.) a	11 colleges in 1949-50 (ACHA Study n.p.) a	87 colleges in 1948-50 (ACHA Study n.p.) a	
3,201 170 65 38 25	4,338 802 369 257 389	1,859 247 81 58 53	2,377 591 294 215 227	11,775 1,810 809 568 694	20-24 25-29 30-34 35-39 40+ --- --- --- --- ---
	NC-5 in 1948-50 (Swanson n.p., Burrill n.p., Ohlson 1956) a		California in 1948-49 (Gillum n.p.) b		
30-39 40-49 50-59 60-69 70-79 80+	42 58 58 50 49 27	64.7 64.2 63.4 63.7 62.5 61.2	64.3 64.1 63.7 64.1 63.6	64.8 64.5 64.0 64.2 63.6	125.9 126.9 125.2 131.0 133.7 --- --- --- --- ---
	Nebraska in 1948-51 (Leverson n.p.) b	Virginia in 1950 (Abraham n.p.) b			
20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-69 70-79	14 35 32 56 44 38 56 42 13	63.9 64.3 64.6 64.1 64.1 63.6 63.8 63.3 62.9	64.3 64.3 64.1 64.0 63.9 63.7 63.6 63.3	63.4 62.8 62.3 60.5	123.3 126.8 131.2 135.1 138.9 143.0 147.6 148.4 --- ---
	Iowa and S. Dakota in 1948-50 (Swanson n.p., Burrill n.p.) c	Georgia in 1950 (Abraham n.p.) c	Colorado in 1948-49 (Dyar n.p.) b	Urban Survey in 1948 (USDA n.p.) f	
20-24 25-29 30-34 35-39 40-44 45-49 50-54 55-59 60-64 65-69 70-79 80+	336 317 272 194 119 36	64.1 64.3 64.2 64.2 64.0 62.8	65.1 65.6 65.4 65.0 64.5	64.0 63.9 63.7 63.4 63.5 63.9 63.7 63.8 63.5	124.9 123.1 131.6 135.0 137.4 147.1 150.9 146.9 141.7 137.2

TABLE 7.—WOMEN, AGED 20 YEARS AND OVER: *Average heights and weights by 5- or 10-year age groups, region, date of measurement, and source of data, 1920-55—Continued*

[illegible]

generally averaged 63 to 65 inches in height. After 1945 the heights were usually between 64 and 66 inches, although heights below 64 inches were found, especially in the Northeast region.

Figures 2 and 3, as well as tables 4 and 5, present regional height data for the only three studies that reported data from all four geographic areas. Two of these [Diehl (1933a and 1933b) and the ACHA Study (n.p.)] are on college students and therefore they are not strictly representative of persons living in the various regions. In the 1955 USDA Survey the sampling was on a national basis of households, so that the data are relatively sparse especially in the West. In general, both men and women college students in the West were the tallest of any region. This was also true for the men in the USDA Survey, but not for the women. Comparative heights in the other three regions were less consistent. In 1948-50 college men were about 1 inch taller and college women about 0.7 inch taller than in 1928-30. Men in the 1955 USDA Survey were slightly shorter, on the average, than the college men.

The college men in the ACHA Study averaged roughly 12 pounds heavier than those of corresponding ages in Diehl's study (1933a), or more than twice the difference expected from the 1 inch difference in height. Weights of the college women in the ACHA Study were only 4 to 5 pounds more than those in Diehl's study (1933b), or much nearer the expected difference for the 0.7 inch difference in height.

The estimates for weights of young men in the 1955 USDA Survey were less for 16 and 17 year olds than the measurements in the ACHA Study in spite of clothing, and the differences for the men 19 to 21 years old were roughly equivalent to clothing weights. The estimates for weights of young women in the 1955 USDA Survey, in spite of clothing being included, were less than the measurements found in the ACHA Study. Women in 1955 were slightly shorter, but not enough so to account for weight differences. It is not known whether these differences were real or whether the estimates in the 1955 USDA Survey were low compared with the actual measurements in the college study.

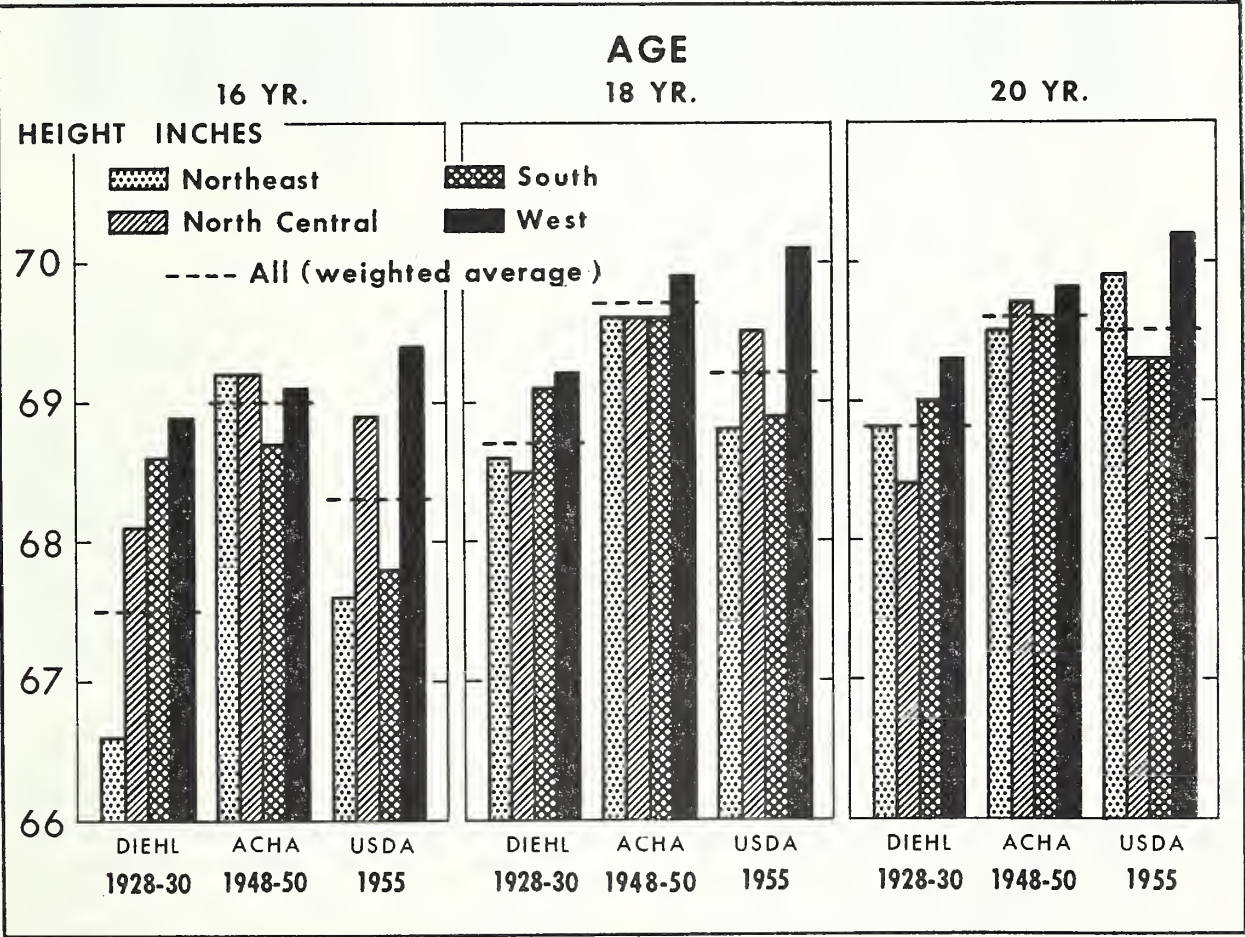


FIGURE 2.—Heights of men by geographic regions, 1928-30, 1948-50, and 1955.

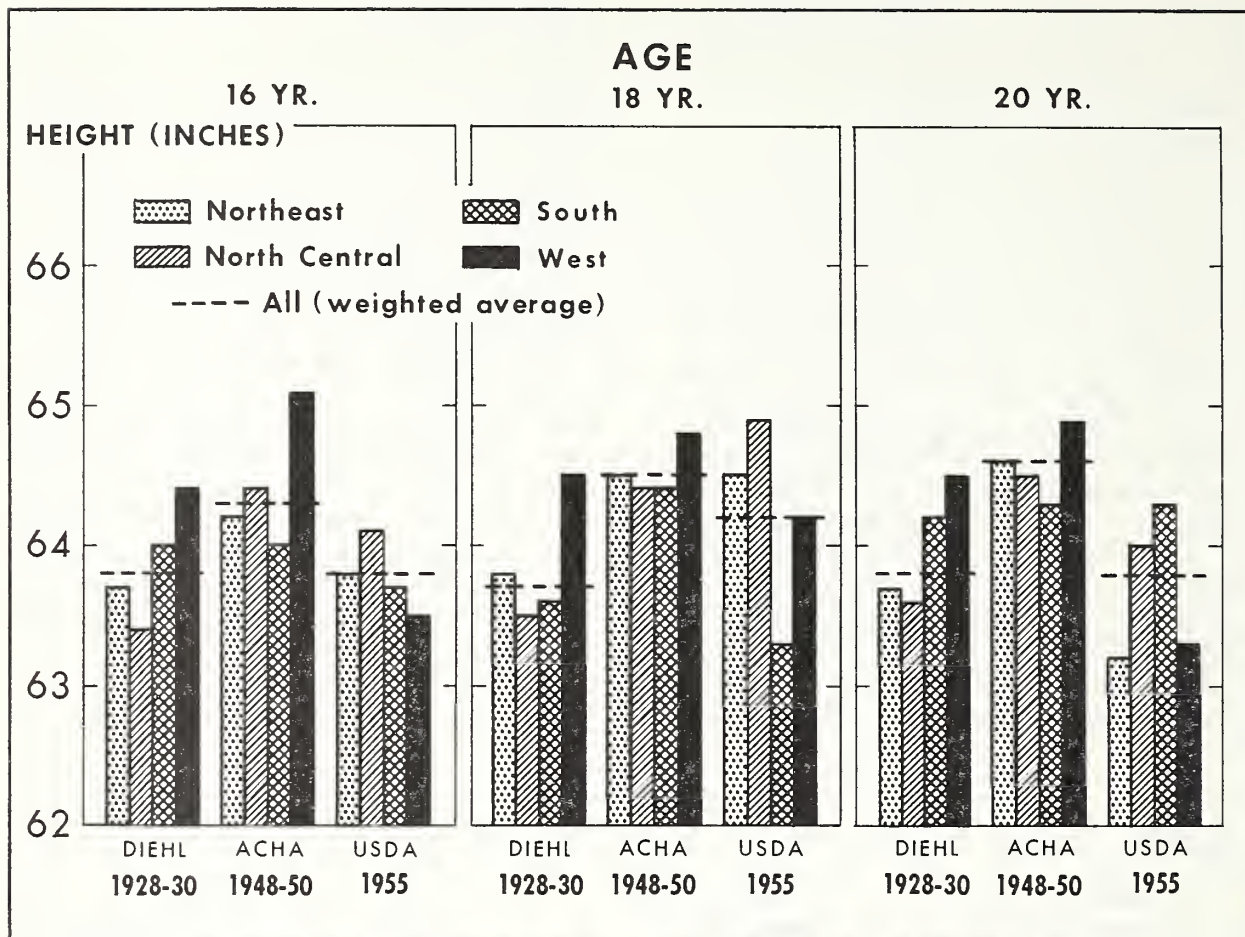


FIGURE 3.—Heights of women by geographic regions, 1928-30, 1948-50, and 1955.

In tables 6 and 7 are presented available data on men and women 20 years of age and over summarized in age groups of 5 to 10 years. The tables are divided into two sections, as were tables 4 and 5, to show data obtained before and after 1945. In the few data available before 1945 no average heights for men exceeded 68.3 inches. After 1945, averages were generally over 69 inches up to 40 years of age, and in some studies up to 50 years. For men 20 to 34 years of age a few averages of 70 inches and over were found. Weights in these groups are difficult to compare because of differences in average heights for age. Weights in the older age groups are discussed further in section II where weights for given heights are presented.

In table 7 average heights for women measured before 1945 were usually under 64 inches when 2 inches was allowed for heel heights. After 1945 heights usually averaged 64 inches or over below 30 years of age, and heights under 63 inches were found primarily in those 60 years and over, occa-

sionally in those 50 to 59 years old. Discussion of weight of women in relation to their height and age is given in section II.

Regional data on both men and women of these older ages have been summarized from the ACHA Study and the 1955 USDA Survey, and on women from the 1938-40 O'Brien study (n.p.). Admittedly the data from the O'Brien study were not typical of specified region since a total of only seven States and D. C. were represented. Some regional tendencies are evident, although it is impossible to separate natives of the region from newcomers, even in the ACHA Study and the 1955 USDA Survey.

Among the college men, those in the Northeast were shorter and in the South taller, on the average, than those in other regions. College men 20 to 29 years of age in the West averaged as tall as those in the South. In the 1955 USDA Survey men in the East were shorter throughout the age range, and men in the West taller at ages 20 to 34 years than those in the other two regions. From age 35 years

on, the differences in the North Central, South, and West were irregular.

Among the college women there was less evidence of regional tendencies than was found for the men. The large colleges for women are located in the Northeast and draw students from all regions. The chief indication of regional difference was that the college women 20 to 29 years of age seemed to be taller in the West. Similar differences were found among the women in the 1955 USDA Survey. It is possible that since 1918 and World War I there is less tendency for people to remain in the area in which they were born, so that differences among regions would be expected to decrease.

Figure 4 illustrates that both men and women averaged about 2 inches taller in 1955 than around 1900, especially in the age range of 20 to 35 years. In the earlier period, average heights of men did not show any tendency to be less at older ages, but heights of women decreased gradually from age 20 to 64 years. Women's heights also decreased with age at a slightly greater rate in 1939-40 than in 1885-1908. In 1955, however, men's heights showed a gradual decrease from age 25 to 64 years, and women's heights, in spite of the fluctuation, showed

no strong tendency to decrease except at 70 to 74 years.

The decrease in average height of persons at later age intervals could be partly real, resulting from slight shrinkage in stature as individuals grow older. It also reflects, however, the trend to greater adult heights attained by each successive generation.

Few data on the effect of aging on stature have been found in which the same persons were measured over a span of years. Reed and Love (1932) reported that there was no significant change in stature of about 730 officers in the U.S. Army measured over a period of about 30 years from about 25 to 55 years of age. Büchi (1950) in Switzerland measured 196 persons, 129 men and 67 women, at two intervals 9 years apart. Heights of men did not decrease noticeably until in their 50's, but women's heights showed some decrease during the middle 40's. Morant (1950) considered that there was a decline of 1 inch in 22 years after British men reached their maximum height, i.e., beginning after 26 years of age in 1880, and after 21.5 years in 1945. Boyne and Leitch (1954) in a review article on secular change in the height of British adults, however, stated that the British Association Anthropometric Committee Reports of 1881-1883 show no decline before age 50 years.

Trotter and Gleser (1951) measured skeletons of 615 males and 240 females ranging in age from 19 to 91 years (the Terry Anatomical collection). They concluded from the relation of stature to bone lengths that the older groups actually never attained stature equivalent to that of the younger groups but that there was some decrease due to age. They considered that the decline begins at about 30 years of age, and amounts to 1.2 cm. in 20 years.

Other illustrations on this question could be men, tioned but until data are available on a representative sample of individuals over their entire life span it will not be settled definitively.

There seems to be no doubt that the weights of the majority of individuals do increase with age. In Reed and Love's study (1932) of consecutive weights of army officers in whom no change of height occurred the men were classified as light, medium, and heavy at 21-25 years of age, and reclassified at 46-55 years. The data (table 8) show that on reclassification only 57 were in the "light" group, while the "heavy" group increased from 27 to 211 men. Average weight at 46-55 years for the medium group was about 14 pounds more than it had been at 21-25 years, and for the heavy group 33 pounds more.

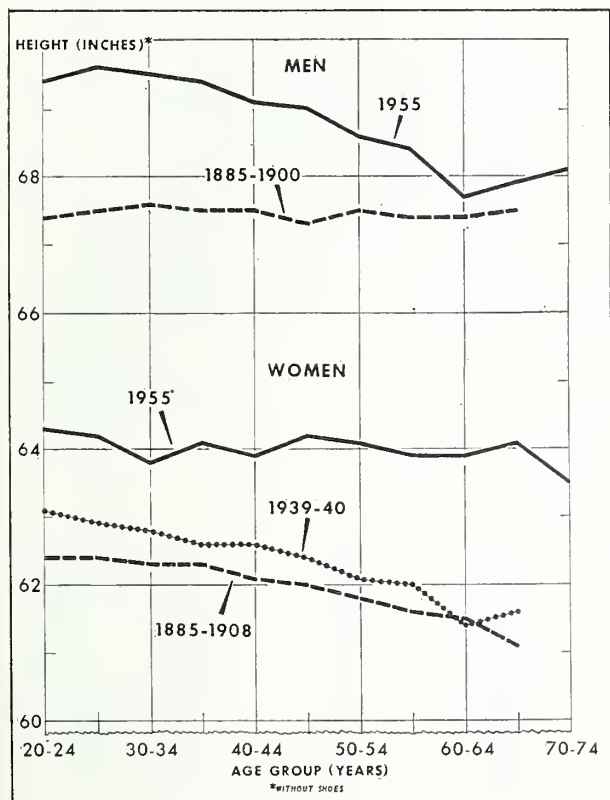


FIGURE 4.—Heights of men and women, three studies between 1885 and 1955.

TABLE 8.—ARMY OFFICERS AGED 21-25 YEARS AND 46-55 YEARS: *Changes in weight with increasing age*¹

Age and weight classification	Cases	Weight at—		
		21-25 years	46-55 years	Change
	<i>Number</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
21-25 years:				
Light-----	119	129	153	+24
Medium-----	581	145	163	+18
Heavy-----	27	181	196	+15
46-55 years:				
Light-----	57	132	132	0
Medium-----	457	141	155	+14
Heavy-----	211	152	186	+33

¹ Source: Reed and Love (1932).

A few additional data on heights and weights in the early 1930's are available. Men and women attending the Chicago "Century of Progress" International Exposition in 1933 and 1934 were measured for heights and weights by Dupertius and Hooton (n.p.). Data were secured on 2,410 men and 2,853 women aged 15 years and over (table 9). Of these people 1,545 men and 1,836 women were native-born of native parentage (table 10). The tallest men were in the groups aged 15 to 29 years and the women, 15 to 34 years. When the data were classified according to area of nativity (table 10), the tallest men came from the mountain area and the tallest women, from the Pacific area of the West. Surprisingly the short-

est women came from the East South Central; those from New England were among the tallest. This group was not representative of the total population of any region, nor of the United States as a whole. The data from "all regions" do confirm the findings, that the younger population are generally taller and lighter in weight than those born in earlier periods. Differences between native-born and total populations cannot be demonstrated because of the marked differences in the numbers in the two groups and lack of information concerning the nationality of most of them.

Special Analyses of Survey Data

Methods of sampling used in the 1948-50 Iowa-South Dakota Survey and the 1955 USDA Survey have made possible special analyses of the data.

Sampling procedures have differed, however, and are described below to orient the users of these data:

In the 1948 Iowa survey of the nutritional status of older women (Swanson n.p. and 1955) an area probability sample was used to locate women 30 years and older. The sample represents 188,300 women in the open country, 151,000 women in rural places, and 206,200 women in urban areas. The following statements indicate adjustments made in the sample:

"To adjust the Iowa sample for noninterviews, a process called office duplication was used. This involved selecting a completed schedule, and duplicating the contents to take the place of one or more missing interviews. For duplication a schedule was selected in one of two ways: either on the basis of some known characteristic(s) of the nonrespondent, or random selection from among eligibles in the same segment or

TABLE 9.—MEN AND WOMEN AT THE CHICAGO CENTURY OF PROGRESS EXPOSITION: *Average heights and weights for age of general visitors, 1933-34*¹

Age in years	Men			Women		
	Cases	Height	Weight	Cases	Height	Weight
	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
15-19-----	370	68.9	144.7	279	64.1	120.8
20-24-----	586	69.2	152.3	602	63.8	121.5
25-29-----	466	68.9	152.6	596	63.9	123.0
30-34-----	289	68.6	155.3	422	63.9	129.0
35-39-----	207	68.4	162.0	259	63.7	132.1
40-44-----	162	68.0	162.9	224	63.4	135.5
45-49-----	101	67.9	163.6	149	63.5	142.4
50-54-----	76	67.8	163.5	127	63.7	145.1
55-59-----	59	68.2	171.1	89	62.7	136.5
60-69-----	74	67.1	159.1	93	62.5	142.8
70+-----	20	66.3	159.5	13	61.1	131.7
Total-----	2,410	68.7	154.9	2,853	63.7	128.3

¹ Source: Dupertius and Hooton (n.p.); dressed in summer clothing, without shoes.

TABLE 10.—MEN AND WOMEN AT THE CHICAGO CENTURY OF PROGRESS EXPOSITION: *Average heights and weights for age of native-born visitors of native parentage, 1933-34*¹

Region of nativity	Men				Women			
	Cases	Age	Height	Weight	Cases	Age	Height	Weight
	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds
Northeast:								
New England.....	59	33	68.6	158.2	67	32	64.2	129.4
Middle Atlantic.....	201	32	68.5	153.7	195	34	63.8	131.9
North Central:								
East.....	684	30	68.9	155.2	934	32	63.6	127.7
West.....	253	31	68.8	157.5	285	31	64.0	127.9
South:								
South Atlantic.....	92	32	69.0	151.8	110	32	64.1	124.6
East South Central.....	86	32	68.3	150.1	62	31	63.4	125.5
West South Central.....	95	25	68.8	151.1	97	31	63.9	123.9
West:								
Mountain.....	39	25	69.6	150.6	42	28	63.9	122.2
Pacific.....	36	26	69.2	151.3	45	28	64.6	128.6
All regions.....	249	15-19	69.0	144.5	197	15-19	64.3	121.7
	848	20-34	69.1	152.5	1,073	20-34	63.9	123.9
	359	35-54	68.4	165.4	467	30-54	63.5	136.2
	89	55-84	67.6	162.4	99	55-79	62.6	140.3
Total.....	1,545	15-84	68.8	154.8	1,836	15-79	63.8	127.7

¹ Source: Dupertius and Hooton (n.p.); dressed in summer clothing without shoes.

TABLE 11.—Percentage of eligible households, and number and percentage participating in USDA Household Food Consumption Survey, 1955

Urbanization	Regions				
	All	North-east	North Central	South	West
Percentage of eligible households					
All urbanizations (weighted) ¹	93	93	92	93	92
Nonfarm.....	92	93	92	92	92
Urban.....	91	92	91	90	91
Rural.....	93	94	92	94	95
Farm.....	98	98	99	98	98
Percentage of eligible households participating					
All urbanizations (weighted) ¹	89	90	86	92	85
Nonfarm.....	88	90	85	92	86
Urban.....	86	88	84	89	84
Rural.....	93	94	89	96	91
Farm.....	91	91	89	94	82
Number of households participating					
All urbanizations (weighted) ¹	4556	1262	1386	1381	526
All urbanizations (unweighted).....	6060	1407	1951	2063	639
Nonfarm.....	4054	1214	1197	1154	489
Urban.....	2832	923	835	695	379
Rural.....	1222	291	362	459	110
Farm.....	2006	193	754	909	150

¹ Farm schedules have $\frac{1}{4}$ weight.

nearby segments in the same zone. Such duplication is not a real substitute for missing data; it does not eliminate any bias due to noninterviews. Essentially this duplication is a weighting process which is simpler to employ than other devices to accomplish the same purpose and sample numbers are kept properly weighted for subsequent calculations."

Similar sampling methods were used for the selection of the South Dakota women in 1949-50 (Burrill n.p.)

The 1955 Survey of Food Consumption of Households in the United States was a national food survey of 6,060 housekeeping households. The sample was constructed to give adequate coverage in order to show separately, data by four regions and three urbanizations. However, there were four times as many farm schedules as would be required for proportionate representation. Therefore, when farm and nonfarm (rural and/or urban) data were combined, each farm schedule was given a weight of one-fourth. Weighted and unweighted counts are shown in table 11.

Of the households visited 7 percent were not housekeeping and were thereby disqualified. The greater the degree of urbanization, the lower the eligibility—91 percent of the urban, 93 percent of the rural nonfarm, and 98 percent of the farm households were eligible. Within the urbanization groups, however, there was only a slight difference by region. (See table 11.) Almost 90 percent of the eligibles participated but the percentage varied both by region and urbanization. In general, the

TABLE 12.—WOMEN, IOWA-SOUTH DAKOTA: *Average heights and weights by age and urbanization, 1948-50*¹

Urbanization and age in years	Iowa			South Dakota		
	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds
Urban:						
30-39-----	128	63.8	132	25	63.6	132
40-49-----	106	64.2	143	18	64.2	134
50-59-----	111	64.5	154	11	63.7	154
60-69-----	81	63.7	144	8	64.0	150
70-79-----	51	64.0	139	4	63.5	150
80-94-----	26	63.9	137	4	60.0	107
Rural place:						
30-39-----	50	64.6	145	14	63.6	126
40-49-----	41	64.8	144	24	64.3	148
50-59-----	50	64.0	145	17	63.8	147
60-69-----	50	63.6	140	17	64.6	158
70-79-----	49	63.8	137	10	63.9	167
80-94-----	7	61.9	127	2	62.5	126
Open country:						
30-39-----	100	64.2	151	45	63.9	142
40-49-----	91	64.8	155	61	63.8	148
50-59-----	69	64.5	161	37	63.5	155
60-69-----	33	65.1	161	20	64.1	166
70-79-----	8	64.1	137	4	65.5	128
80-84-----	3	61.7	148			

¹ Sources: Swanson (n.p.) and Burrill (n.p.).

participation in the South and Northeast was greater than in the West and North Central regions and was greater in the rural (farm and nonfarm) than in the urban areas. Investigation of the characteristics along with the number of eligible nonparticipants does not point to material bias either in food consumption or height-weight-age data. Heights were reported as without shoes and weights were in ordinary indoor clothing.

Relation of heights and weights to urbanization

Data on the Iowa-South Dakota women are presented in table 12. In general, the Iowa women living in the open country were as tall as or taller than those living in the urban and rural place areas, and consistently their weights were considerably higher through age 69 years. In the South Dakota study the numbers in each age group were small, but the women living in the rural places were generally slightly taller than those living in cities or open country, and the women living in the open country were generally the heaviest.

Data on the men and women in the 1955 USDA Survey are presented in tables 13 and 14, and figures 5 and 6. For the men in the United States as a whole there were no consistent differences in the heights or weights related to urbanization. In three regions the tallest men were the lightest: in the Northeast the rural farm men, in the North Central the rural non-

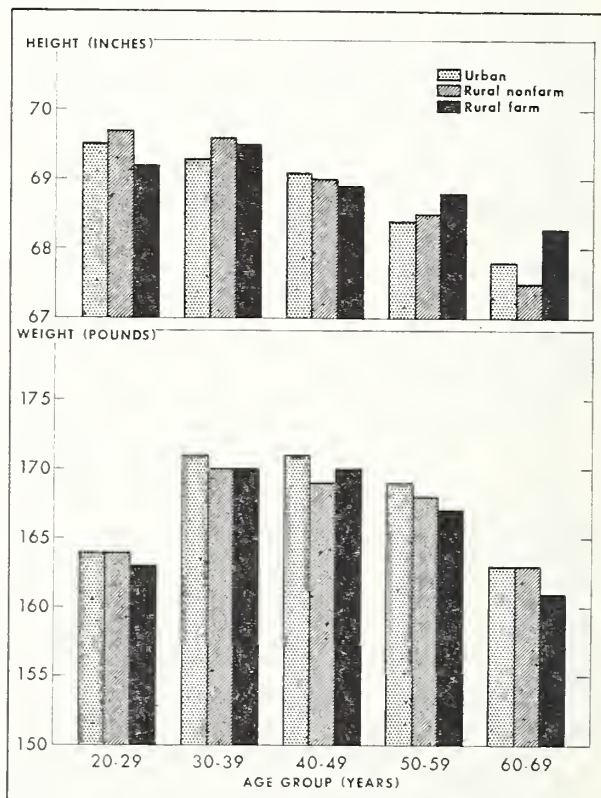


FIGURE 5.—Heights and weights of men by urbanization, USDA Household Food Consumption Survey, 1955.

TABLE 13.—MEN, USDA SURVEY: *Average heights and weights by age, region, and urbanization, Household Food Consumption Survey, 1955*

Urbanization and age in years	Northeast			North Central			South			West			All United States		
	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds
Urban:															
20-29-----	154	68.9	161	158	69.8	167	134	69.8	164	60	70.0	162	506	69.5	164
30-39-----	211	68.8	170	192	69.5	174	177	69.4	169	83	69.9	173	663	69.3	171
40-49-----	198	68.6	172	181	69.5	172	146	69.1	169	75	69.2	170	600	69.1	171
50-59-----	151	68.1	171	131	68.4	169	100	68.7	167	72	69.0	166	454	68.4	169
60-69-----	115	67.4	164	113	68.1	166	62	68.1	155	34	67.8	161	324	67.8	163
Rural nonfarm:															
20-29-----	60	69.7	167	55	69.8	163	92	69.4	161	14	70.9	167	221	69.7	164
30-39-----	82	70.0	176	93	69.8	168	126	69.3	167	27	69.7	173	328	69.6	170
40-49-----	61	68.3	170	71	69.7	174	99	68.8	168	29	69.6	160	260	69.0	169
50-59-----	48	67.9	168	48	69.0	172	66	68.6	166	20	68.9	166	182	68.5	168
60-69-----	25	64.0	162	43	68.4	163	47	68.1	163	18	68.7	165	133	67.5	163
Rural farm ¹ :															
20-29-----	38	69.4	164	152	69.3	165	155	69.0	161	17	69.4	161	362	69.2	163
30-39-----	52	69.7	174	184	69.6	171	181	69.1	166	54	70.7	172	471	69.5	170
40-49-----	37	69.2	170	203	69.1	173	272	68.8	167	38	68.9	171	550	68.9	170
50-59-----	47	68.1	167	150	69.3	175	189	68.6	162	29	69.2	162	415	68.8	167
60-69-----	36	68.5	159	133	68.6	166	178	68.1	158	20	68.7	166	367	68.3	161

¹ Numbers of subjects shown for rural farm are four times those used in tables with all urbanizations combined (see p. 21 and table 11).

TABLE 14.—WOMEN, USDA SURVEY: Average heights and weights by age, region, and urbanization, Household Food Consumption Survey, 1955

Urbanization and age in years	Northeast			North Central			South			West			All United States		
	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds	Cases	Height Inches	Weight Pounds
Urban:															
20-29-----	169	63.9	129	172	64.4	128	168	64.1	129	68	64.8	129	577	64.2	129
30-39-----	240	63.8	135	246	63.9	133	194	64.0	138	95	63.8	130	775	63.9	135
40-49-----	220	63.5	140	193	64.0	140	167	64.1	147	90	64.0	138	670	63.9	141
50-59-----	179	63.9	149	147	63.9	147	111	63.9	145	85	63.6	144	522	63.9	147
60-69-----	146	63.7	150	119	64.3	152	91	64.0	144	32	64.2	144	388	64.0	149
Rural nonfarm:															
20-29-----	68	64.3	132	68	64.2	131	98	64.3	129	23	64.2	134	257	64.2	131
30-39-----	81	63.9	137	92	63.8	134	133	63.9	136	18	64.4	134	324	63.9	135
40-49-----	68	64.0	147	75	64.6	142	101	64.1	145	29	64.3	148	273	64.3	145
50-59-----	43	64.5	155	54	64.1	154	68	64.3	153	24	63.2	148	189	64.1	153
60-69-----	35	63.3	151	55	64.3	139	53	63.7	147	7	64.0	145	150	63.8	145
Rural farm ¹ :															
20-29-----	38	64.2	131	143	64.5	134	139	64.2	132	34	64.6	132	354	64.3	133
30-39-----	57	64.3	143	190	64.6	141	208	64.6	141	44	64.0	137	499	64.5	141
40-49-----	45	63.9	156	177	64.6	147	269	64.4	150	32	63.9	147	523	64.4	149
50-59-----	34	64.7	165	142	64.5	150	190	64.1	151	26	64.4	150	392	64.3	152
60-69-----	36	64.2	149	106	64.3	144	134	64.4	147	16	64.1	148	292	64.3	146

¹ Numbers of subjects shown for rural farm are four times those used in tables with all urbanizations combined (see p. 21 and table 11).

farm men, and in the South the urban men. In the West the rural nonfarm men were slightly taller than those in the other two urbanizations, but the weights averaged about the same for the three urbanizations.

Regardless of region the urban women showed some tendency to be shorter and rural farm women taller than the other groups. The urban women were also lighter, and rural farm women heavier than the other groups; but differences in weight among the women in the three groups were not large and not consistent among age groups. Since Iowa and South Dakota are in the North Central region, the measurements of women in the State food surveys of 1948-50 were compared with those of North Central women in the 1955 USDA Survey. The women living in the open country in Iowa and South Dakota were found to be heavier than women in the North Central rural farm areas in the 1955 USDA Survey. Heights and weights of women in the other urbanizations were variable.

Relation of heights and weights to education of the homemaker

Height-weight data for men and women related to age, region, and education of the homemaker are

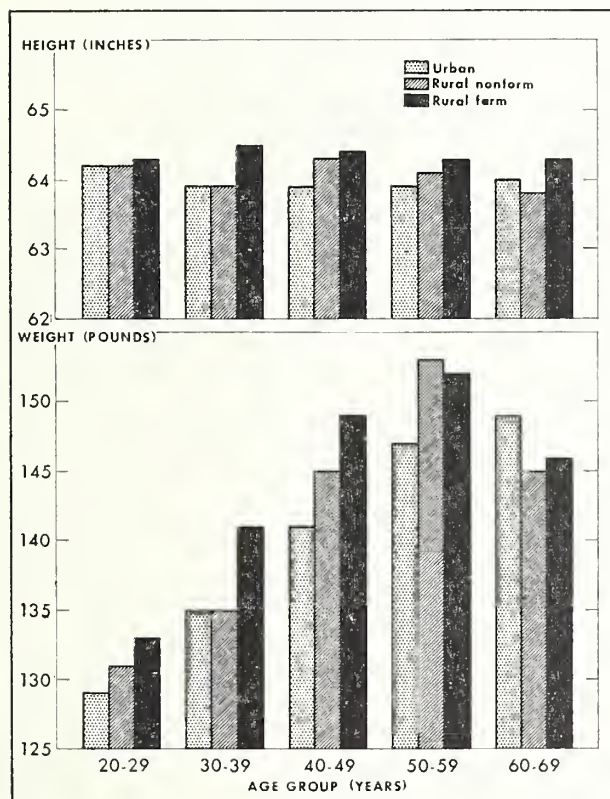


FIGURE 6.—Heights and weights of women by urbanization, USDA Household Food Consumption Survey, 1955.

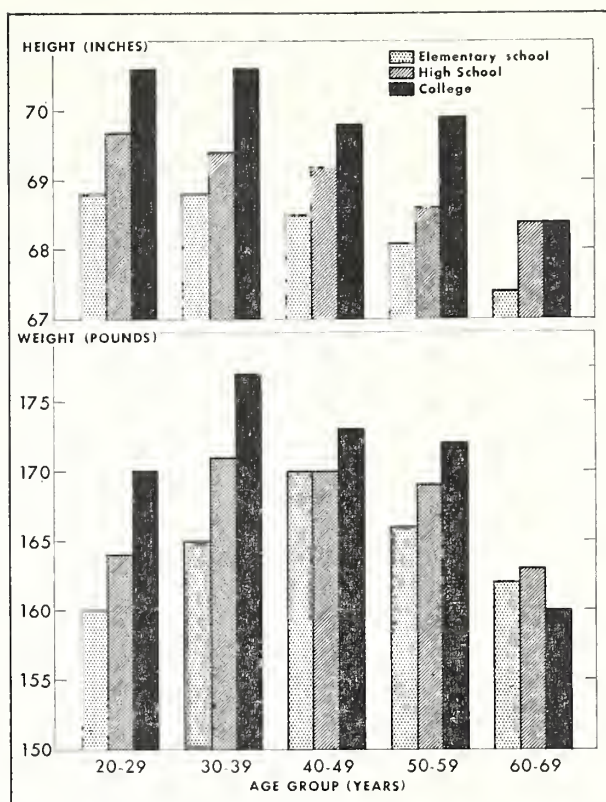


FIGURE 7.—Heights and weights of men by education of the homemaker, USDA Household Food Consumption Survey, 1955.

presented in tables 15 and 16, and figures 7 and 8. For the men in each age group heights showed a direct relationship (except for 60-69 year old southerners) with the education of the homemaker (usually the wife)—the shortest having homemakers with only elementary school education and the tallest having homemakers with at least some college training. Weights generally were in the same direction, but older men living in households in which the homemakers had some college training were not as much heavier as might be expected for their greater heights.

The women, too, showed direct relationship between heights and extent of education of the homemaker (table 16 and figure 8). Women in households in which the homemaker had elementary school training only were heavier, however, than the taller women in households in which the homemaker had some college training. This was particularly noticeable in the group aged 40 to 49 years. Those with elementary training averaged 0.7 inch shorter but 17 pounds heavier than those with some college training.

These relationships are particularly interesting in

TABLE 15.—MEN, USDA SURVEY: *Average heights and weights by age, region, and education of the homemaker, Household Food Consumption Survey, 1955*

Education of homemaker and men's age in years	Northeast			North Central			South			West			All United States		
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds
Elementary school:															
20-29-----	64	68.5	158	59	69.3	166	105	68.9	158	13	68.1	158	241	68.8	160
30-39-----	56	68.3	168	65	69.2	165	132	68.8	164	12	68.2	168	265	68.8	165
40-49-----	78	67.6	170	85	69.0	173	128	68.7	167	13	68.5	173	304	68.5	170
50-59-----	80	67.3	167	80	68.4	173	120	68.3	163	20	68.6	155	300	68.1	166
60-69-----	78	65.9	164	88	67.9	162	79	68.3	161	25	67.8	161	270	67.4	162
High school:															
20-29-----	120	69.1	164	152	69.7	165	122	69.9	166	42	70.3	158	436	69.7	164
30-39-----	191	69.3	171	198	69.4	172	170	69.4	168	74	70.0	174	633	69.4	171
40-49-----	139	68.8	171	152	69.5	172	136	69.3	169	62	69.2	165	489	69.2	170
50-59-----	85	68.4	173	85	68.5	168	61	69.0	165	48	69.0	167	279	68.6	169
60-69-----	42	68.1	162	63	68.7	167	49	68.2	158	18	68.2	161	172	68.4	163
College:															
20-29-----	23	70.6	167	26	70.8	170	28	70.1	167	16	71.3	176	93	70.6	170
30-39-----	41	70.1	178	57	70.6	176	35	71.4	181	32	70.6	174	165	70.6	177
40-49-----	37	69.9	175	54	70.0	173	31	69.4	174	29	69.6	172	151	69.8	173
50-59-----	26	70.2	171	35	70.2	168	20	69.4	182	23	69.7	172	104	69.9	172
60-69-----	13	68.5	162	14	68.9	167	11	67.3	147	3	69.1	162	41	68.4	160

TABLE 16.—WOMEN, USDA SURVEY: *Average heights and weights by age, region, and education of the homemaker, Household Food Consumption Survey, 1955*

Education of homemaker and women's age in years	Northeast			North Central			South			West			All United States		
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds
Elementary school:															
20-29-----	52	63.6	128	55	63.8	129	104	64.4	133	10	64.8	139	221	64.1	133
30-39-----	82	63.4	143	80	63.9	141	145	63.7	138	17	63.3	136	324	63.7	140
40-49-----	98	63.4	148	96	64.2	148	161	63.7	154	18	62.8	157	373	63.7	151
50-59-----	108	63.8	154	104	64.0	153	132	63.9	148	30	62.9	146	374	63.8	151
60-69-----	86	63.4	151	96	64.1	147	91	63.9	150	14	64.6	147	287	63.9	150
High school:															
20-29-----	152	64.2	130	171	64.2	129	153	64.0	128	61	64.6	130	537	64.2	129
30-39-----	188	63.9	133	228	63.8	134	183	64.3	137	73	63.8	130	672	64.0	134
40-49-----	154	63.6	140	147	64.2	140	126	64.6	141	60	64.2	140	487	64.1	140
50-59-----	83	64.1	148	81	64.0	147	68	64.5	151	49	64.0	144	281	64.2	148
60-69-----	68	63.5	150	61	64.8	149	62	64.1	142	18	64.2	140	209	64.1	148
College:															
20-29-----	34	64.1	131	43	65.2	130	33	64.2	120	25	64.8	129	135	64.6	128
30-39-----	44	64.4	134	66	64.7	130	42	63.8	133	32	64.5	129	184	64.4	131
40-49-----	40	64.3	133	54	64.0	131	38	64.8	140	44	64.5	135	176	64.4	134
50-59-----	30	64.5	146	42	64.3	142	19	64.2	143	27	63.5	137	118	64.2	142
60-69-----	16	64.3	153	24	63.5	144	16	64.1	135	6	64.8	147	62	64.0	144

Correlated Data on Heights and Weights

Serial data on college students

Further evidence that people of this country are taller and correspondingly heavier in successive decades comes from data on heights and weights of freshman college students. Bowles in 1932 summarized data on Harvard men and Wellesley women (table 17) born between 1836 and 1915, and therefore in college from about 1855 to 1931. For both men and women there was a gradual but steady increase in average heights amounting to about 1.7 inches over the 60 to 80 years.

Serial data on measurements of students entering other colleges in the United States furnish evidence that entering students tend to be younger, taller, and heavier now than formerly. Data for men are presented in tables 18, 19, and 20. The earliest record is that for men entering Amherst College in 1861. At that time the students averaged 20 years of age, 66.8 inches in height, and 131 pounds in weight, compared with those in 1957 who averaged about 18 years, 70.5 inches, and 158 pounds. Yale records extend from 1883 to 1957. The average age for their entering students has decreased from 19 to 18 years, the average height increased from about 67.5 to 70.5 inches, and the weights from 138 to 157 pounds. Figure 9 shows by use of 3-year moving averages for heights and weights that in these two colleges the greatest increase in both average height and weight occurred in the quarter century 1925-1950. At both colleges the average gain in weight per inch of gain in height was roughly 7 pounds.

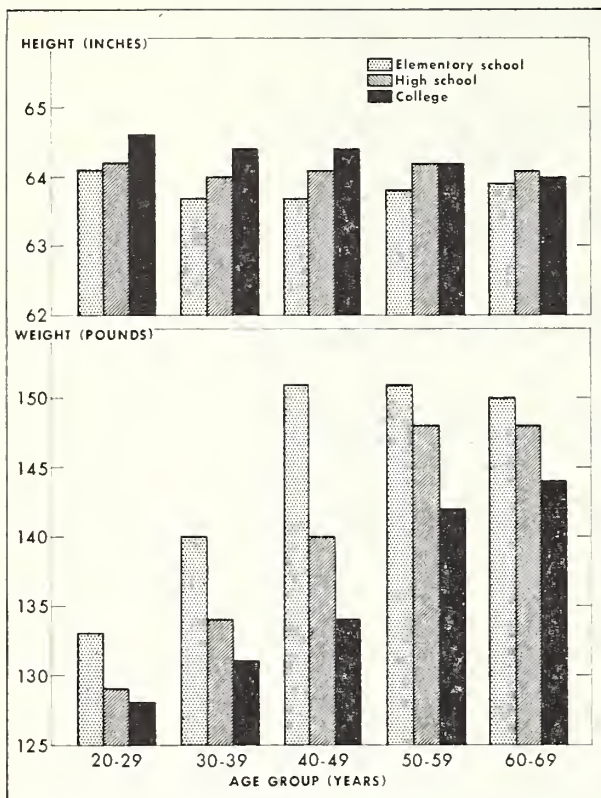


FIGURE 8.—Heights and weights of women by education of the homemaker, USDA Household Food Consumption Survey, 1955.

view of the fact that, in general, diets were rated higher nutritionally for households with homemakers younger (USDA 1959) and having more formal education (USDA n.p.).

TABLE 17.—HARVARD MEN AND WELLESLEY WOMEN: *Average heights and weights by decades of birth, 1836-1915*¹

Birth date	Harvard men			Wellesley women		
	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds
1836-45	2	67.1	140.0			
1846-55	43	68.5	140.6			
1856-65	335	68.1	138.4	45	63.3	119.9
1866-75	506	68.7	139.7	235	63.3	120.4
1876-85	307	69.1	146.8	212	63.7	120.7
1886-95	267	69.4	149.2	40	64.3	121.6
1896-1905	607	69.8	148.9	266	64.6	123.7
1906-15	546	70.1	149.0	267	65.0	125.2

¹ Source: Bowles (1932).

TABLE 18.—MEN ENTERING AMHERST COLLEGE AND YALE UNIVERSITY: *Average ages, heights, and weights, 1861-1957*¹

Year of entrance	Amherst College					Yale University				
	Men meas- ured	Age	Height	Weight	Men 72 inches and over	Men meas- ured	Age	Height	Weight	Men 72 inches and over
	<i>Number</i>	<i>Years</i>	<i>Inches</i>	<i>Pounds</i>	<i>Percent</i>	<i>Number</i>	<i>Years</i>	<i>Inches</i>	<i>Pounds</i>	<i>Percent</i>
1861-----	75	20.1	66.8	130.8	4.0	-----	-----	-----	-----	-----
1862-----	56	20.0	67.2	132.4	1.8	-----	-----	-----	-----	-----
1863-----	50	20.2	63.3	130.8	6.0	-----	-----	-----	-----	-----
1864-----	45	19.7	68.2	137.6	6.7	-----	-----	-----	-----	-----
1865-----	53	19.0	68.2	130.6	6.7	-----	-----	-----	-----	-----
1866-----	67	19.9	66.5	135.0	1.5	-----	-----	-----	-----	-----
1867-----	73	19.8	67.3	132.4	2.7	-----	-----	-----	-----	-----
1868-----	62	20.2	68.9	133.3	6.4	-----	-----	-----	-----	-----
1869-----	74	19.4	67.6	132.1	1.4	-----	-----	-----	-----	-----
1870-----	72	19.6	66.9	130.0	0.0	-----	-----	-----	-----	-----
1871-----	62	19.0	66.9	130.6	0.0	-----	-----	-----	-----	-----
1872-----	77	19.2	68.1	140.5	6.5	-----	-----	-----	-----	-----
1873-----	92	19.4	67.3	134.3	4.3	-----	-----	-----	-----	-----
1874-----	103	18.5	67.5	131.8	2.9	-----	-----	-----	-----	-----
1875-----	86	19.3	67.0	134.9	2.3	-----	-----	-----	-----	-----
1876-----	74	19.3	67.3	136.6	4.1	-----	-----	-----	-----	-----
1877-----	85	18.9	68.8	133.0	2.4	-----	-----	-----	-----	-----
1878-----	91	19.3	67.9	131.4	2.2	-----	-----	-----	-----	-----
1879-----	109	19.3	68.2	139.1	5.5	-----	-----	-----	-----	-----
1880-----	83	19.0	67.8	134.8	3.6	-----	-----	-----	-----	-----
1881-----	89	19.1	67.2	131.2	2.2	-----	-----	-----	-----	-----
1882-----	80	19.3	67.7	130.9	3.8	-----	-----	-----	-----	-----
1883-----	69	18.8	67.4	133.8	4.3	162	19.1	67.7	137.8	4.3
1884-----	100	19.5	67.3	130.4	2.0	139	19.0	67.8	136.9	6.4
1885-----	97	18.9	68.3	136.5	3.1	219	18.8	67.5	136.2	4.5
1886-----	66	18.3	67.8	132.9	1.5	255	18.8	67.5	133.5	4.3
1887-----	93	19.1	67.8	130.7	5.4	299	18.8	67.5	134.2	2.6
1888-----	92	19.7	68.0	133.2	6.5	306	18.8	67.6	134.7	3.2
1889-----	102	19.4	68.1	136.5	6.9	293	19.0	67.6	135.5	4.4
1890-----	73	19.4	68.3	132.1	5.5	307	18.9	67.7	135.0	3.9
1891-----	84	19.2	67.8	132.5	6.0	278	18.8	67.9	136.3	4.6
1892-----	134	19.1	67.6	134.0	5.2	237	19.1	68.0	137.7	8.4
1893-----	135	19.1	68.2	135.1	3.7	257	18.8	68.0	133.7	1.5
1894-----	110	19.6	67.9	135.1	3.6	381	18.8	68.0	136.8	7.1
1895-----	118	18.1	68.1	136.0	5.9	328	18.9	67.9	138.5	4.8
1896-----	97	19.4	67.8	132.7	2.1	339	18.9	68.1	138.9	5.3
1897-----	95	19.0	67.9	130.5	3.0	377	19.0	67.9	137.0	5.0
1898-----	120	18.8	67.6	133.1	3.3	416	19.1	68.0	135.4	4.3
1899-----	100	19.4	68.0	135.8	8.0	434	18.9	68.2	137.5	6.4
1900-----	119	19.3	68.0	131.4	5.0	405	19.0	68.1	137.0	5.6
1901-----	111	19.6	67.6	135.1	10.0	419	19.2	68.1	138.0	5.9
1902-----	107	19.0	68.0	131.8	1.9	406	19.0	68.3	138.1	7.1
1903-----	117	19.2	68.1	137.8	3.4	497	19.1	68.4	138.3	7.4
1904-----	112	18.6	68.1	135.4	3.6	408	18.9	68.1	136.1	5.6
1905-----	156	18.8	68.4	138.4	7.0	428	18.9	68.0	136.7	6.3
1906-----	155	19.0	68.5	138.7	5.8	461	18.8	68.0	138.6	6.0
1907-----	165	19.0	68.4	135.8	7.9	478	18.9	67.9	137.4	4.3
1908-----	169	19.3	68.4	140.0	8.3	459	19.1	68.2	138.9	5.4
1909-----	186	18.8	68.1	135.4	6.5	430	19.0	68.4	140.9	6.7
1910-----	145	18.8	68.3	136.9	2.8	506	19.1	68.5	139.3	7.1
1911-----	145	18.7	68.2	137.6	11.0	491	19.0	68.3	142.1	7.7
1912-----	113	19.2	68.7	136.0	8.0	501	19.1	68.4	140.9	6.7
1913-----	136	18.7	68.6	138.2	11.0	505	18.9	68.4	142.0	8.1
1914-----	122	18.7	68.9	136.1	9.8	478	19.0	68.6	141.3	9.8

TABLE 18.—MEN ENTERING AMHERST COLLEGE AND YALE UNIVERSITY: *Average ages, heights, and weights, 1861-1957*¹—*Con.*

Year of entrance	Amherst College					Yale University				
	Men measured	Age	Height	Weight	Men 72 inches and over	Men measured	Age	Height	Weight	Men 72 inches and over
	<i>Number</i>	<i>Years</i>	<i>Inches</i>	<i>Pounds</i>	<i>Percent</i>	<i>Number</i>	<i>Years</i>	<i>Inches</i>	<i>Pounds</i>	<i>Percent</i>
1915.....	119	18.8	68.8	135.9	14.3	455	18.9	68.7	143.1	10.7
1916.....	167	18.7	68.5	139.3	11.8	707	19.1	68.4	142.0	9.2
1917.....	124	18.5	68.5	136.1	8.0	532	18.8	68.3	140.0	8.8
1918.....	105	18.4	68.8	136.7	12.4	(²)	(²)	(²)	(²)	(²)
1919.....	139	18.7	68.8	139.1	6.5	660	19.1	68.4	142.0	10.1
1920.....	169	18.5	69.0	138.2	8.9	660	19.0	68.9	140.2	10.7
1921.....	170	18.4	68.7	140.2	10.0	856	18.8	69.1	142.7	13.7
1922.....	179	18.4	69.1	138.9	11.7	765	18.8	68.8	143.6	10.7
1923.....	168	18.7	68.5	138.4	10.7	750	18.7	69.0	141.5	13.2
1924.....	211	18.4	69.1	141.8	13.6	849	18.7	69.1	143.9	15.0
1925.....	232	18.4	68.5	138.3	9.9	848	18.8	69.0	142.8	14.1
1926.....	232	18.3	69.3	139.6	11.4	878	18.7	69.3	143.3	14.8
1927.....	230	18.2	69.3	139.6	13.0	879	18.6	69.1	143.8	15.6
1928.....	197	18.3	69.5	140.5	12.7	880	18.7	69.3	142.3	15.3
1929.....	201	18.3	69.4	140.8	14.4	830	18.7	69.5	144.6	16.9
1930.....	202	-----	69.2	139.9	16.3	832	18.7	69.4	145.4	18.2
1931.....	185	18.3	69.4	143.4	17.3	853	18.7	69.6	145.6	16.5
1932.....	197	18.2	69.5	141.7	15.2	880	18.6	69.7	147.1	16.3
1933.....	231	18.4	69.9	143.4	15.6	829	18.6	69.6	148.6	18.0
1934.....	218	18.4	69.3	141.3	17.4	777	18.5	69.5	148.0	16.9
1935.....	234	18.2	69.6	144.2	17.5	864	18.4	69.8	149.1	18.5
1936.....	218	18.4	69.5	142.1	18.7	842	18.4	69.7	149.0	18.7
1937.....	231	18.4	69.8	141.5	21.0	842	18.4	69.8	149.7	20.6
1938.....	230	18.4	70.0	147.7	24.0	848	18.4	69.9	152.1	19.4
1939.....	233	18.4	70.2	151.2	22.0	836	18.4	70.0	151.1	20.0
1940.....	232	18.3	69.8	147.6	19.0	856	18.4	70.1	151.6	21.9
1941.....	260	18.3	70.1	149.9	19.2	980	18.3	70.0	151.1	22.6
1942.....	-----	-----	-----	-----	-----	³ 1,205	18.1	70.1	151.4	22.2
1943.....	-----	-----	-----	-----	-----	³ 656	17.7	69.8	148.1	20.1
1944.....	-----	-----	-----	-----	-----	³ 617	17.7	69.8	149.7	19.9
1945.....	-----	-----	-----	-----	-----	73	19.2	69.8	150.2	24.6
1946.....	338	18.5	70.2	153.2	24.0	1,066	19.7	70.2	155.5	16.5
1947.....	248	18.5	70.2	151.9	21.0	1,048	18.2	70.2	154.5	18.0
1948.....	260	18.2	70.4	153.5	24.9	1,177	18.2	70.2	153.6	17.6
1949.....	250	18.1	70.5	153.0	29.2	1,124	18.4	70.5	155.7	17.5
1950.....	252	18.2	70.1	158.0	23.8	1,049	18.4	70.5	158.6	20.1
1951.....	280	18.1	70.3	156.8	26.8	1,167	18.2	70.3	156.0	18.9
1952.....	245	18.0	70.3	156.4	29.4	1,017	18.2	70.2	156.0	22.5
1953.....	271	18.0	70.3	157.6	28.0	1,032	18.3	70.4	159.0	20.7
1954.....	253	18.1	70.3	157.6	30.0	1,001	18.2	70.4	160.0	25.1
1955.....	307	18.2	70.7	156.9	27.0	988	18.2	70.4	160.0	30.6
1956.....	265	18.1	70.6	159.9	32.1	1,012	18.2	70.5	158.0	28.5
1957.....	240	18.1	70.5	157.6	32.9	1,001	18.3	70.5	157.0	29.4

¹ Sources: Amherst College (Amherst, Mass.), Hitchcock, Marsh, Whitmore, and Durkan (n.p.); Yale University (New Haven, Conn.), Deegan (1941), and Kiphuth and Reilly (n.p.).

² Data for only 18 men out of 809 were reported.

³ Combined data for all groups entering during the calendar year due to accelerated program.

At the University of Kansas from 1898 to 1952 (table 19) the average age of the students measured did not change much, but by 5-year averages the heights increased from 68.2 to 70.0 inches, the weights from 139 to 156 pounds, or a gain of about 9 pounds per inch of height.

The percentages of men at Amherst, Yale, and Kansas who were classed as tall (72 inches and over) are of special interest (tables 18 and 19). At Amherst only one class before 1910, those entering in 1901, had as many as 10 percent tall men; from 1937 all but two classes had over 20 percent tall men, and in 1956 and 1957 tall men made up over 30 percent of the class. At Yale the class entering in 1915 was the first to have as many as 10 percent in this tall category, and that of 1937 the first one to have over 20 percent. In the years following World War II the Yale percentages dropped somewhat, but in 1955 to 1957 they also had increased to around 30 percent. The percentages of tall men at the University of Kansas were usually smaller at each comparable period than those at Amherst and Yale but had increased to nearly 20 percent by 1948-1952.

Heights of men in the Universities of Cincinnati, Wisconsin, and Washington (table 20) showed trends over the shorter periods for which data were available that are similar to those in the longer series in table 18. Mackinnon and Jackson (1931) also showed that about 1,200 men who entered the University of Minnesota between 1898 and 1901 averaged 21.8 years of age, 68.2 inches, and 139.2 pounds. The 1,800 men entering in 1929 averaged 20.2 years, 68.9 inches, and 143.1 pounds, a decrease of about 1½ years in age, with an increase of 0.7 inch in height and about 4 pounds in weight.

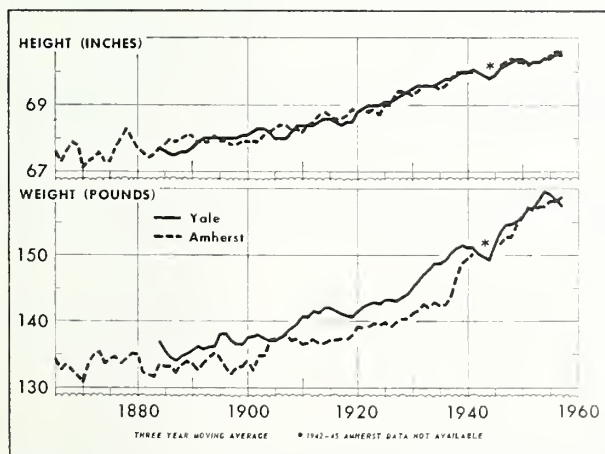


FIGURE 9.—Serial heights and weights of students entering Amherst College and Yale University from 1861 to 1957.

TABLE 19.—MEN ENTERING THE UNIVERSITY OF KANSAS: Average ages, heights and weights, 1898-1952¹

Years of entrance	Men measured	Age	Height	Weight	Men 72 inches and over
	Number	Years	Inches	Pounds	Percent
1898-1907-----	411	19.7	68.2	139.4	5.7
1908-1912-----	980	19.5	68.3	138.0	3.8
1913-1917-----	1,037	19.6	68.2	140.2	5.7
1918-1922-----	1,063	19.7	68.5	139.3	6.9
1923-1927-----	1,043	19.6	68.9	144.2	9.7
1928-1932-----	710	19.5	69.0	144.6	10.2
1933-1937-----	1,447	19.9	69.3	145.1	15.5
1938-1942-----	1,401	19.9	69.6	146.7	14.4
1943-1947-----	1,144	19.8	69.6	153.4	16.3
1948-1952-----	1,487	20.0	70.0	155.6	19.7

¹ Source: University of Kansas (Lawrence), Elbel (1954).

Serial height-weight data on students entering various women's colleges are presented in tables 21, 22, and 23. The longest records are from two eastern colleges. Vassar from 1884 to 1957, and Smith from 1899 to 1956. Heights of Vassar students have increased from about 63 inches in the 1880's to just over 65 inches in the 1950's. A slight hump to about 65.5 inches occurred in the 1940's. Average weights increased from about 118 pounds in the 1880's to about 127 pounds in the 1950's, or 4 to 5 pounds per inch of increased height.

Average heights of Smith students increased from 63.2 inches in 1899 to 65.4 inches in 1956, the average weights from about 120 to 127 pounds, or, as for Vassar, about 4 pounds per inch of increased height.

Figure 10, showing 3-year moving averages for heights and weights of women from these colleges, corresponds to figure 9 for men from Amherst and Yale. The average heights of Vassar College women showed a sharper rise in the 1890's and early 1900's than those of the men, then paralleled their gains in height until about 1930. Heights of the Vassar women reached a plateau in the 1930's, attained their maximum in the early and middle 1940's, returned in 1948 to the level of the early 1930's, and have maintained this level since that time. Heights of the Smith women follow a curve similar to that of the men. Since 1948 the average heights of the Vassar and Smith women have been about the same, about 5 inches less than those for the men.

The weight curves of the women at these two colleges are similar. They parallel the weight curves of the Yale men to about 1920 then flatten out more. In fact the women showed fluctuations of about 6

TABLE 20.—MEN ENTERING THE UNIVERSITIES OF CINCINNATI, WISCONSIN, AND WASHINGTON: Average ages, heights, and weights, 1908-49

Year of entrance	Cincinnati				Wisconsin				Washington			
	Men measured	Age	Height	Weight	Men measured	Age	Height	Weight	Men measured	Age	Height	Weight
	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds
1908	---	---	---	---	---	---	---	---	400	20.3	68.1	137.7
1909	---	---	---	---	---	---	---	---	308	20.1	68.5	141.5
1910	---	---	---	---	---	---	---	---	344	20.1	68.9	142.2
1911	---	---	---	---	---	---	---	---	370	20.1	68.3	143.0
1912	---	---	---	---	---	---	---	---	379	20.0	68.3	142.8
1913	---	---	---	---	---	---	---	---	441	20.1	68.2	142.7
1914	---	---	---	---	---	---	---	---	464	20.0	68.3	141.8
1915	---	---	---	---	---	---	---	---	459	19.8	68.6	143.8
1916	150	19.4	67.4	132.0	---	---	---	---	569	19.8	68.6	143.2
1917	172	19.0	68.0	135.0	---	---	---	---	400	19.6	68.1	143.1
1918	54	18.4	67.2	121.7	---	---	---	---	(2)	(2)	(2)	(2)
1919	272	19.7	67.9	134.6	---	---	---	---	883	20.4	68.7	144.9
1920	593	19.5	68.0	135.2	---	---	---	---	1,283	19.9	68.4	143.4
1921	489	19.2	68.1	136.7	---	---	---	---	775	19.6	68.4	141.8
1922	472	19.2	68.2	135.9	---	---	---	---	909	19.5	68.5	142.7
1923	480	19.3	68.2	136.8	---	---	---	---	1,020	19.6	68.4	143.3
1924	581	19.2	68.2	137.2	---	---	---	---	995	19.6	68.3	144.3
1925	599	19.3	68.5	137.9	---	---	---	---	1,208	19.6	68.5	143.8
1926	566	19.1	68.3	137.6	---	---	---	---	1,633	19.6	68.8	145.4
1927	641	19.3	68.2	139.4	---	---	---	---	1,195	19.5	69.0	145.7
1928	607	19.3	68.4	138.2	---	---	68.7	141.6	1,607	19.4	68.7	144.1
1929	434	19.4	68.7	140.9	---	---	69.2	143.0	1,512	19.2	68.1	144.1
1930	815	19.2	68.4	139.9	---	---	68.7	143.3	1,429	19.3	69.0	146.0
1931	503	19.0	68.6	141.2	---	---	68.9	142.5	1,102	19.3	69.4	147.6
1932	313	18.8	69.0	142.3	---	---	69.6	144.8	1,127	19.4	69.6	147.3
1933	381	18.9	69.1	149.1	16-19	---	69.5	143.4	1,598	19.5	69.2	148.5
1934	390	18.8	69.1	143.4	---	---	69.6	146.0	1,924	19.5	69.3	149.2
1935	456	18.8	69.2	141.8	---	---	69.6	145.4	1,873	19.5	69.4	149.0
1936	477	18.8	69.4	145.1	---	---	69.6	146.4	2,136	19.5	69.4	149.6
1937	538	18.9	69.2	141.0	---	---	69.7	146.2	2,201	19.6	69.8	149.8
1938	---	---	---	---	---	---	70.0	147.8	2,001	19.4	69.6	150.4
1939	---	---	---	---	---	---	70.2	147.5	1,701	19.3	69.6	150.8
1940	---	---	---	---	---	---	---	---	1,708	19.1	69.6	151.6
1941	---	---	---	---	---	---	---	---	1,668	19.0	69.7	152.3
1942	---	---	---	---	---	---	---	---	1,913	18.9	68.1	153.4
1943	---	---	---	---	---	---	---	---	1,660	18.2	68.8	147.3
1944	---	---	---	---	---	---	---	---	776	18.6	68.8	147.3
1945	---	---	---	---	---	---	---	---	811	19.0	69.4	152.6
1946	---	---	---	---	---	---	---	---	1,216	22.2	69.7	155.5

TABLE 21.—WOMEN ENTERING VASSAR, SMITH, AND NEWCOMB COLLEGES, AND STANFORD AND WASHINGTON UNIVERSITIES:
Average heights and weights, 1884-1957 1—Continued

Year of entrance	Vassar College			Smith College			Newcomb College			Stanford University		
	Women measured	Height	Weight	Women measured	Height	Weight	Women measured	Height	Weight	Women measured	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds	Number	Inches	Pounds
1913-----	296	64.2	124.8	498	63.6	124.6	111	63.0	117.5	146	63.7	---
1914-----	341	64.1	122.1	545	63.7	123.6	93	63.2	118.1	168	63.9	---
1915-----	303	64.2	124.3	526	63.7	123.1	116	63.1	116.8	178	63.7	---
1916-----	227	64.1	124.5	642	63.6	124.8	152	63.4	117.8	170	64.0	---
1917-----	239	64.4	122.3	646	64.1	121.4	109	63.3	113.3	238	64.2	---
1918-----	228	64.5	124.4	730	64.3	124.0	93	63.0	117.3	276	63.8	---
1919-----	242	64.4	126.1	479	64.1	124.5	197	63.0	116.2	157	63.6	---
1920-----	296	64.7	125.8	504	64.0	125.6	206	63.5	117.4	299	64.0	---
1921-----	277	64.6	125.6	---	---	---	183	63.3	115.2	---	---	---
1922-----	323	64.6	123.4	---	---	---	179	63.7	118.3	---	---	---
1923-----	310	64.6	123.2	---	---	---	176	63.3	116.7	---	---	---
1924-----	334	64.6	123.9	---	---	---	214	63.5	116.5	---	---	---
1925-----	331	65.2	123.6	639	64.3	125.5	252	63.4	116.1	---	---	---
1926-----	354	65.0	125.4	638	64.1	124.5	219	63.1	114.4	---	---	---
1927-----	337	64.9	125.6	660	64.4	124.0	215	63.4	114.8	---	---	---
1928-----	330	65.2	125.2	552	64.1	122.8	188	63.8	116.7	---	---	---
1929-----	287	65.2	126.7	608	64.1	124.1	---	---	---	---	---	---
1930-----	345	65.1	125.5	633	64.3	123.3	---	---	---	---	---	---
1931-----	215	65.2	125.8	606	64.4	123.9	---	---	---	---	---	---
1932-----	405	65.0	125.7	526	64.4	125.0	---	---	---	---	---	---
1933-----	362	65.1	125.7	664	64.5	124.2	---	---	---	---	---	---
1934-----	377	65.2	126.0	658	64.6	126.5	---	---	---	---	---	---
1935-----	322	65.3	127.0	627	64.8	124.8	---	---	---	---	---	---
1936-----	348	65.3	126.4	509	64.4	120.7	---	---	---	---	---	---
1937-----	363	65.2	124.6	610	64.5	123.5	---	---	---	---	---	---
1938-----	347	65.2	126.5	596	65.2	126.9	---	---	---	---	---	---
1939-----	352	64.3	127.9	471	64.6	125.8	---	---	---	---	---	---
1940-----	366	65.5	129.9	510	64.7	125.6	---	---	---	---	---	---
1941-----	349	64.3	130.1	560	64.7	126.8	---	---	---	---	---	---
1942-----	378	65.4	126.9	514	65.2	126.6	---	---	---	---	---	---
1943-----	500	65.5	128.0	448	64.9	128.1	---	---	---	---	---	---
1944-----	447	65.6	127.4	523	65.1	127.0	---	---	---	---	---	---
1945-----	474	65.5	127.9	518	65.2	127.9	---	---	---	---	---	---
1946-----	430	65.5	127.0	582	65.1	128.1	---	---	---	---	---	---
1947-----	399	65.5	127.1	585	65.1	127.4	---	---	---	---	---	---
1948-----	391	65.2	126.8	640	65.2	128.1	---	---	---	---	---	---
1949-----	392	65.3	127.3	623	65.2	127.4	---	---	---	---	---	---

TABLE 22.—WOMEN ENTERING WOMAN'S COLLEGE OF NORTH CAROLINA AND THE UNIVERSITY OF KANSAS:
Average heights and weights, 1916-48¹

Years of entrance	North Carolina			Kansas		
	Women measured	Height	Weight	Women measured	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds
1916-1920	404	63.6	116.4			
1921-1925	1,139	63.6	116.6			
1926-1930	1,396	64.0	118.0	307	63.6	117.7
1931-1935	1,284	64.2	119.7	354	64.4	118.9
1936-1940	1,762	64.4	119.8	271	63.9	118.5
1941-1945	1,474	64.8	121.1			
1946-1948	56	64.8	119.1	191	64.5	122.2

¹ Source: Woman's College of North Carolina (Greensboro) and University of Kansas (Lawrence), in Mills (1950).

pounds from 1920 to 1957, whereas in the same period the men showed rather steady gains in average weights of as much as 17 to 20 pounds.

Students entering Newcomb College of Tulane University (table 21), Woman's College of North Carolina and the University of Kansas (table 22), and the Universities of Cincinnati, Wisconsin, and Washington, and Hollins College (table 23) were generally shorter than those at Vassar and Smith in corresponding years, and were also lighter in weight. Women at Stanford (table 21) were about the same height as those at Vassar and Smith, but weights for them were not reported.

The changes in both height and weight have been so gradual at some stages in the long-term series of data on college students that they might have been discounted in a short-term series. Average heights of men at Amherst and Yale since 1946 ranged within ± 0.2 inch of the overall average of 70.3

inches. Average heights of women in the long series at Vassar and Smith have varied little (± 0.2 inch) since 1946, leveling off at about 65.3 inches.

Are these, then, the maximum average heights to be expected? Similar plateaus have been reached before, so that it seems unwise to predict one way or the other. Mills in 1938 and 1941 considered that there was a reversal in the human growth tide in women at around 64 to 64.5 inches based on his data from the colleges. The Metropolitan Life Insurance Co. in 1938 also considered that "It is unlikely that it (average height of women) will exceed that already reported for certain favorably situated groups today such as college women." The figure quoted in their article was 164.5 cm. (64.8 inches), or about 0.5 inch less than that attained by Vassar and Smith students since 1946.

Family data

Although the college data give good evidence of increased heights and weights in successive generations of college students, evidence from successive generations within families is even more convincing. In table 24 are given comparisons of several father-son or mother-daughter pairs, reported by Bowles (1932). In none of these cases were data on the other parent available. In all cases average heights of the younger generation were greater than those of the older generation by at least 1 inch. For these greater heights average weights of the sons were generally 5 to 10 pounds more than those of their fathers, of the daughters 2 to 5 pounds more than those of their mothers. Table 25 shows that the total height difference between the first and fourth generation of Harvard men was 3 inches. Weights showed no consistent trends.

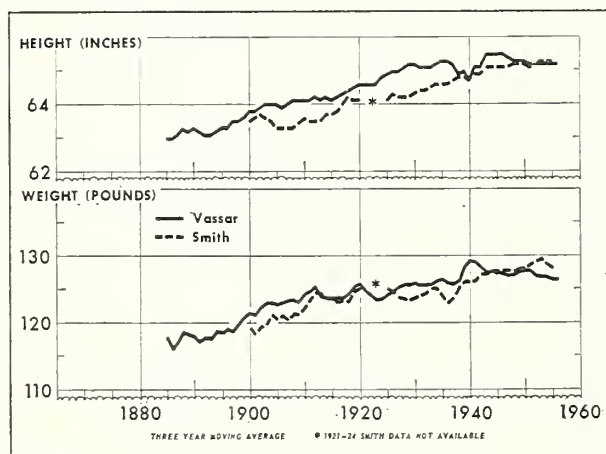


FIGURE 10.—Serial heights and weights of students entering Vassar and Smith Colleges from 1884 to 1957.

TABLE 23.—WOMEN ENTERING THE UNIVERSITIES OF CINCINNATI, WISCONSIN, AND MINNESOTA, AND HOLLINS COLLEGE:
Average ages, heights, and weights, 1912-49¹

Year of entrance	Cincinnati				Wisconsin				Minnesota				Hollins			
	Women measured	Age	Height	Weight	Women measured	Age	Height	Weight	Women measured	Age	Height	Weight	Women measured	Age	Height	Weight
	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds	Number	Years	Inches	Pounds
1912	---	---	---	---	---	---	---	---	400	20.4	63.5	119.4	---	---	---	---
1913	---	---	---	---	---	---	---	---	428	20.3	63.6	119.9	---	---	---	---
1914	---	---	---	---	---	---	---	---	520	20.6	63.7	120.6	---	---	---	---
1915	---	---	---	---	---	---	---	---	603	20.2	63.6	121.2	---	---	---	---
1916	153	18.9	62.9	119.0	---	---	---	---	695	20.6	63.7	121.2	---	---	---	---
1917	126	19.0	63.0	118.6	---	---	---	---	684	20.4	63.8	121.6	---	---	---	---
1918	136	18.9	62.6	114.6	---	---	---	---	681	20.1	63.7	120.4	---	---	---	---
1919	128	18.5	63.1	119.3	---	---	---	---	1,047	20.0	63.6	120.4	---	---	---	---
1920	192	18.5	63.0	120.1	---	---	---	---	837	20.1	63.5	120.1	85	(²)	63.2	120.2
1921	206	18.3	62.6	118.6	---	---	---	---	976	20.5	63.7	121.7	125	---	63.7	114.7
1922	178	18.5	63.0	122.1	---	---	---	---	1,017	20.1	63.7	121.6	127	---	64.0	115.9
1923	191	18.6	63.1	119.3	---	---	---	---	1,095	20.3	63.6	121.7	128	---	64.0	117.7
1924	212	18.7	62.8	117.4	---	---	---	---	1,123	20.1	63.8	121.3	143	---	64.4	115.4
1925	59	19.1	63.8	121.5	---	---	---	---	1,204	20.0	63.7	120.2	128	---	63.8	112.3
1926	246	19.0	63.9	122.7	---	---	---	---	1,366	20.0	63.7	120.2	140	---	63.9	112.8
1927	174	18.6	63.4	121.5	---	---	---	---	1,378	19.5	63.8	121.0	141	---	63.8	116.8
1928	108	18.5	63.7	119.8	---	---	---	---	1,339	20.0	63.9	122.1	---	---	---	---
1929	102	19.0	63.5	118.5	---	---	---	---	1,393	20.1	63.6	121.8	---	---	---	---
1930	306	18.6	63.7	122.5	---	---	---	---	---	---	---	---	---	---	---	---
1931	321	18.4	63.6	119.4	---	---	---	---	---	---	---	---	---	---	---	---
1932	262	18.6	63.7	118.6	(³)	16-19	---	---	---	---	---	---	---	---	---	---
1933	310	18.6	64.2	122.4	---	---	---	---	---	---	---	---	---	---	---	---
1934	383	18.4	63.7	121.8	---	---	---	---	---	---	---	---	---	---	---	---
1935	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1936	331	18.0	63.7	120.9	---	---	---	---	---	---	---	---	---	---	---	---
1937	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1938	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1939	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1948-1949	308	17-19	64.5	124.1	---	---	---	---	---	---	---	---	---	---	---	---

¹ Sources: University of Cincinnati (Ohio), Chenoweth (1937), and Mills (1950); University of Wisconsin (Madison), Mills (1941); University of Minnesota (Minneapolis, St. Paul), Jackson (1931); and Hollins College (Roanoke, Va.), Palmer (1927).

² Average age 17+.

³ Average of 785 students per year.

⁴ Average values for bracketed years.

TABLE 24.—HARVARD MEN AND WELLESLEY, VASSAR, SMITH, AND MT. HOLYOKE WOMEN: *Average heights and weights of fathers and sons, and mothers and daughters*¹

University or college	Age	Cases	Heights	Weights	Age	Cases	Heights	Weights
	<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
	Fathers				Sons			
Harvard-----	17	89	68.4	135.7	17	218	69.7	145.7
	18	281	68.5	139.4	18	531	70.0	149.0
	19	323	68.8	142.0	19	444	70.0	150.4
	20	177	68.7	146.6	20	164	69.8	151.1
	21	99	68.2	143.5	21	53	69.7	151.4
	Mothers				Daughters			
Wellesley-----	18	62	63.8	123.8	18	69	64.9	123.0
	19	64	63.3	120.0	19	101	64.4	123.6
	20	41	63.3	120.2	20	52	64.9	124.7
Vassar-----	19.5	205	63.5	121.2	17.9	241	64.6	123.5
Smith-----	18.0	208	63.7	120.6	17.5	228	65.0	125.2
Mt. Holyoke-----	18.3	51	63.9	120.6	17.9	62	65.0	127.8
	19.4	35	63.4	117.4	18.1	40	64.3	122.8

¹ Source: Bowles (1932).

TABLE 25.—HARVARD MEN: *Average heights and weights of fathers and sons, four generations*¹

Generation	Age when measured	Cases	Height	Weight
	<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
Great grand-fathers-----	50	8	67.0	149.5
Grandfathers-----	30	92	68.6	152.4
Fathers-----	19	132	69.0	145.8
Sons-----	18	153	70.1	151.1

¹Source: Bowles (1932).

In table 26 are reported data from a group of California youth relating their heights and weights to similar data for both parents (Bayley 1954). The boys averaged an inch taller than their fathers, the girls 1.4 inches taller than their mothers, and 1.2 and 1.6 inches more, respectively, than would be expected from the mid-parent rule of prediction. (*See footnote to table 26 and Gray 1948.*) Other data reported in Bayley's paper show more relationships of boys' heights and weights to similar measurements of their fathers and of the girls' heights and weights to those of their mothers than vice versa.

Recent data on daughters and their parents were also available for 1,162 Vassar students in classes

TABLE 26.—BERKELEY YOUTH AND THEIR PARENTS: *Average heights and weights*¹

Boys and parents	Cases	Height	Weight	Girls and parents	Cases	Height	Weight
	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>		<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
Boys at 18 years-----	21	71.4	154.4	Girls at 18 years-----	20	65.3	126.9
Mature ² boys-----	22	71.6	157.5	Mature girls-----	24	65.3	129.9
Parents of boys:				Parents of girls:			
Fathers-----	22	70.6	-----	Fathers-----	20	68.7	-----
Mothers-----	22	65.0	-----	Mothers-----	20	63.9	-----
Mid-parent prediction ³ -----	22	70.4	-----	Mid-parent prediction ³ -----	20	63.7	-----

¹ Source: Bayley (1954).

² Heights after closure of all epiphyses in hand and knee, often after 18 years in boys.

³ Boys' mothers' heights multiplied by 1.08, girls' fathers' heights multiplied by 0.923, and average of adjusted height and that of other parent.

TABLE 27.—VASSAR STUDENTS AND THEIR PARENTS: *Average heights, 1958*¹

Students or parents	Freshmen	Sophomores	Juniors	Seniors	All students
	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>	<i>Inches</i>
Students.....	65.1	65.2	65.1	65.1	65.1
Mothers.....	64.3	64.6	64.5	64.5	64.5
Fathers.....	69.9	70.1	69.9	69.8	69.9

¹Source: Myers (n.p.).

1958-61 (Myers n.p.). Data for heights of the fathers and mothers (natural parents) were obtained by direct request to the parents. Heights of the daughters were taken from college records of physical examinations as freshmen. Average heights by class groups are given in table 27. Since there were no significant differences among the averages for the daughters in the four class groups, correlation analyses were made for the entire college group.

The daughters ranged from 57 to 76 inches in height, the mothers from 57 to 73 inches, and the fathers from 60 to 77 with one of 85 inches. Heights of daughters related to heights of mothers and fathers are presented in table 28. Of the students 363, or 31 percent, were shorter than their mothers; 208, or 18 percent, were the same height; and 591, or 51 percent, were taller than their mothers; 1,125, or 97 percent, were shorter than their fathers; 18, or 1.5 percent, were the same height; and 19, or 1.6 percent, were taller than their fathers.

The correlation coefficient for heights of daughters and fathers was 0.49 and for daughters and mothers, 0.51. Regression equations were, respectively,

$$Y = 32.98 + 0.498X$$

and

$$Y = 35.21 + 0.427X$$

where Y represents the daughter's height and X the height of the father or mother. Each correlation coefficient was significantly different from zero at the 1-percent level and when squared was approximately 0.25. That is, about 25 percent of the variation in a daughter's height is explained by the linear regression of Y on X (father's or mother's height). Seventy-five percent of the variation in the daughter's height, therefore, is due to factors other than either parent's height.

In table 29 is presented a summary of the heights and weights of urban adults and their parents from the 1955 USDA Survey. Since no significant differences were found between the heights of parents or children in the various categories by regions the data

were combined for the entire group. Even sons under 20 years of age averaged as tall or taller than their fathers, and as tall or taller than expected by the midparent rule of Gray (1934). According to this rule the son's expected height is the average of the father's height and 1.08 times the mother's height. In most cases the older sons who had reached mature heights, were taller than expected by this rule, in many cases more than 1 inch taller.

Daughters often reach mature height by 16 years, and usually by 18 years. As might be expected, therefore, most groups of daughters were as tall as or taller than expected. The only exceptions were groups in which less than 10 daughters were found. The midparent rule for daughters is the average of 0.923 times father's height and mother's height. Children in Bayley's study (1954) and Vassar students (Myers n.p.) were also taller on the average than predicted by Gray's midparent rule. Durnin and associates (1952) found that students in Glasgow, Scotland in 1951 were generally taller than their parents of the same sex. They were about 1.7 inches taller than would be predicted by Gray's midparent rule.

These differences between predicted and actual heights would imply that children growing up in the late 1940's and 1950's are taller than those who reached mature heights in the 1930's and 1940's.

Pearson and Lee (1903) had proposed formulas for predicting heights of children related to heights of their parents: son's height = 14.08 + 0.409 times his father's + 0.430 times his mother's height ± 1.42 ; and daughter's height = 10.82 + 0.386 times her father's height + 0.431 times her mother's height ± 1.33 . Because of the nearly 3 inches leeway allowed in these formulas (± 1.42 or ± 1.33 inches), the actual values in the studies reported here all fall within the expected range.

Percentage of "Tall" Men and Women

Six feet or 72 inches is popularly considered tall for men. Less emphasis has been given in the litera-

TABLE 28.—VASSAR STUDENTS AND THEIR PARENTS: *Comparative heights, 1958*¹

Heights of parents (inches)		Number of daughters of specified heights by height of parents																		Total
		57 inches	58 inches	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	76 inches	
Mothers:																				
57					1			1											1	
58						1		1			1								3	
59				1															11	
60					3			9											41	
61				6	5			22		8									162	
62	1				18			35		17									171	
63		1		3	5			32		26									162	
64				4	14			29		34									171	
65				1	2			13		42									171	
66					2			8		23									134	
67								2		11									98	
68				1				1		8									52	
69										3									24	
70										4									19	
71										2									1	
72																			1	
73																			1	
Total	1	1	9	30	50	101	156	188	195	186	113	82	31	12	2	3	1	1	1,162	
Fathers:																				
60																			1	
61																			2	
62				1															3	
63																			5	
64																			18	
65																			29	
66																			67	
67																			114	
68	1																		141	
69		1																	142	
70			2																169	
71				2															187	
72																			137	
73																			61	
74																			52	
75																			16	
76																			13	
77																			4	
85																			1	
Total	1	1	9	30	50	101	156	188	195	186	113	82	31	12	2	3	1	1	1,162	

¹ Source: Myers (n.p.).

TABLE 29.—URBAN ADULTS AND THEIR PARENTS, USDA SURVEY: Average heights, Household Food Consumption Survey, 1955

Parents' age in years	Children's age range	Cases	Fathers		Mothers		Sons			Cases	Fathers		Mothers		Daughters			
			Age	Height	Age	Height	Age	Height	Age		Height	Age	Height	Age	Height	Age	Height	Ex-pected height ¹
Years	Number	Years	Inches	Years	Inches	Years	Inches	Years	Inches	Years	Inches	Years	Inches	Years	Inches	Years	Inches	
Fathers and mothers both under 50.	Under 20	95	44	69.1	41	63.7	17	69.1	69.0	105	43	69.7	41	63.8	17	64.3	64.1	
	20-24	37	45	69.1	43	63.9	22	70.1	69.0	30	46	69.2	44	64.1	21	64.2	64.0	
	25-39	3	49	69.0	48	65.0	28	70.7	69.6	2	49	72.0	48	63.5	26	64.0	65.0	
Fathers 50-59, mothers under 50.	Under 20	29	52	67.7	46	64.6	17	68.8	68.8	33	52	68.6	45	64.1	17	63.8	63.7	
	20-24	19	52	66.7	46	64.3	22	68.0	68.0	17	54	67.8	46	62.9	22	64.0	62.8	
	25-39	6	54	69.0	47	63.3	26	71.3	68.7	6	53	69.0	46	64.0	28	63.8	63.8	
Fathers and mothers both 50-59.	Under 20	20	55	68.2	53	62.6	18	69.3	67.9	22	54	68.6	52	63.3	17	63.9	63.2	
	20-24	22	54	68.7	52	64.2	22	70.0	69.0	17	55	69.1	53	63.5	22	65.5	63.6	
	25-39	23	55	68.8	53	63.8	28	70.0	68.8	21	56	69.2	54	64.7	30	65.8	64.3	
Fathers over 60, mothers over 40.	Under 20	11	64	67.3	54	63.6	18	68.9	68.0	6	66	68.0	51	63.3	17	62.3	63.0	
	20-24	8	63	68.4	57	63.9	22	70.8	68.7	20	63	67.9	55	63.5	23	64.6	63.1	
	25-39	47	66	68.1	60	63.4	32	69.0	68.3	51	66	68.2	61	63.9	33	64.9	63.4	
	40 and over	12	72	68.9	68	63.2	44	68.5	68.6	22	71	67.3	66	63.6	44	65.4	62.9	

¹ From Gray (1948) midparent rule:

father's height + 1.08 mother's height

2

Son's expected height is

0.923 father's height + mother's height

2

Daughter's expected height is

TABLE 30.—TALL MEN: *Percentage of men 72 inches and over without shoes, three studies between 1885 and 1955*

Age in years	Medico-actuarial study 1885-1900 ¹			ACHA Study 1948-1950 ²			USDA Survey 1955 ³		
	Total	72 inches and over ⁴		Total	72 inches and over		Total	72 inches and over	
	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent
18-19				39,692	10,141	25.5			
20-24	34,293	1,178	3.4	35,673	8,505	23.8	371	111	29.9
25-29	49,709	1,882	3.8	12,318	2,691	21.8	447	127	28.4
30-34	46,299	1,748	3.8	4,101	796	19.4	512	144	28.1
35-39	36,217	1,380	3.8				596	155	26.0
40-44	23,941	890	3.7	569	77	13.5	526	128	24.3
45-49	13,700	522	3.8				471	86	18.3
50-54	7,406	263	3.6				392	77	19.6
55-59	3,609	110	3.0				347	54	15.6
60-64	1,144	25	2.2				281	45	16.0
65-69	243	6	2.5				268	37	13.8
70+	22	0	0				349	59	16.9

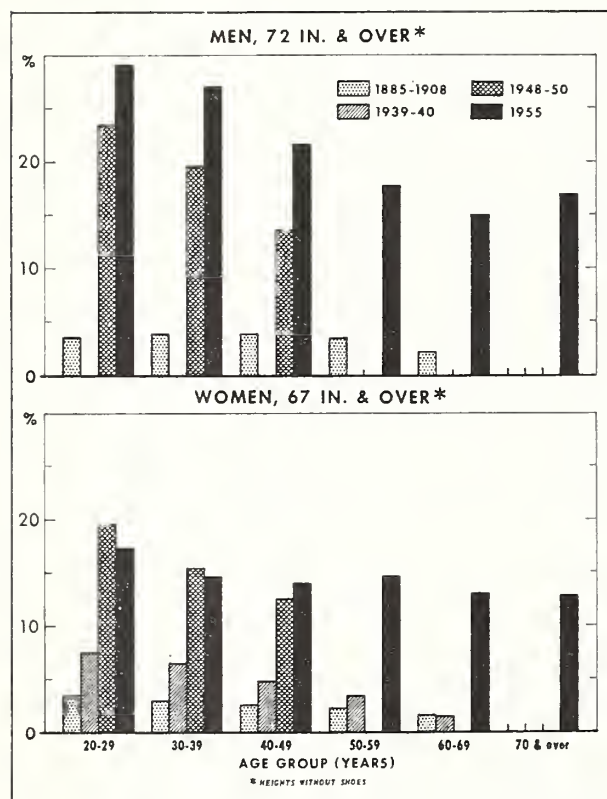
¹ Source: Association of Life Insurance Medical Directors (1912).² Source: American College Health Association Study (n.p.).³ Source: 1955 USDA Household Food Consumption Survey (n.p.).⁴ Data for men 73 inches and over *with shoes*.

FIGURE 11.—Percentage of "tall" men and women from four studies between 1885 and 1955.

ture to "tall" women, but "tall apparel shops" usually cater to women over 67 inches. Dublin and Marks (1938, 1952) considered as tall, men 71 inches

and over and women 67 and over. Use of 67 inches and over for tall women results in percentages for the early years comparable with those for men.

The percentages of "tall" men and women of various ages available from cross-sectional studies showing records of heights and weights of large numbers of individuals are shown in table 30 for men and table 31 for women.

Figure 11 makes possible comparison of data on men and women: 1885-1908 from the medico-actuarial study (1912); 1939-40 for women only, from the O'Brien study (n.p.); 1948-50, from the American College Health Association study; and 1955, from the 1955 USDA Survey. A marked increase is shown in the percentage of tall men and women since the early 1900's, confirming for larger and more general groups the evidence already shown for college men from Amherst and Yale (table 18). The tendency for the percentages of tall women in 1955 to be slightly lower than those of the college women in 1948-50 bears out the fact shown in table 16, that women with some college education were taller on the average than those with only elementary or high school education.

A combination of many factors is probably responsible for the trends toward an increased proportion of tall persons in the more recent studies. Some of these factors are discussed in sections IV and V.

TABLE 31.—TALL WOMEN: *Percentage 67 inches and over without shoes, four studies between 1885 and 1955*

Age in years	Medico-actuarial study 1885-1908 ¹			O'Brien study 1939-1940 ²			ACHA Study 1948-1950 ³			USDA Survey 1955 ⁴		
	Total			Total			Total			Total		
	67 inches and over ⁵			67 inches and over			67 inches and over			67 inches and over		
	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent	Number	Number	Percent
18-19-----				793	73	9.2	28,528	5,077	17.8			
20-24-----	22,187	815	3.7	1,661	129	7.8	11,775	2,304	19.6	426	77	18.1
25-29-----	31,300	969	3.1	1,368	96	7.0	1,810	332	18.3	497	82	16.5
30-34-----	28,251	858	3.0	1,285	88	6.8	1,377	211	15.3	579	80	13.8
35-39-----	21,391	640	3.0	1,215	69	5.7				645	99	15.3
40-44-----	13,406	348	2.6	1,099	63	5.7				579	81	14.0
45-49-----	8,117	197	2.4	933	32	3.4	694	87	12.5	494	69	14.0
50-54-----	4,570	106	2.3	679	21	3.1				458	67	14.6
55-59-----	1,995	37	1.9	516	19	3.7				351	52	14.8
60-64-----	576	10	1.7	432	6	1.4				318	38	11.9
65-69-----	107	1	0.9							293	42	14.3
70+-----	5	0	0	60	0	0				379	48	12.7

¹ Source: Association of Life Insurance Medical Directors (1912).² Source: O'Brien study of women's measurements (n.p.).³ Source: American College Health Association Study (n.p.).⁴ Source: 1955 USDA Household Food Consumption Survey (n.p.).⁵ Data for women 69 inches and over *with shoes*.

SECTION II.—AVERAGE WEIGHTS FOR HEIGHT AND AGE

What are the most desirable weights for given heights, and how should they vary with age? This question is particularly pertinent at present because of the problems of obesity and the related importance of control of weight with increasing age. It seemed desirable, therefore, to report how tables now in use were formulated and to judge their applicability for present-day use. The problems complicating comparison of data from difference sources and how they have been handled are explained in section I, page 2.

Published Tables Proposed as Standards

The earliest tables of weights for height and age of "Americans" have come from life insurance records. The development of these tables has been described by Lew (1954) and Marks (1956). The first table for men was that of the Association of Life Insurance Medical Directors in 1897, based on 74,162 male applicants accepted for life insurance in the United States and Canada and known as Shepherd's table. In 1900 the National Fraternal Congress published a similar table, based on measurements of 133,940 men insured in fraternal orders in the United States

and Canada. Both of these are cited in the Medico-Actuarial Mortality Investigation of 1912. The first extensive table on women was that of Weisse (1909, 1912) of the Mutual Life Insurance Co. of New York, based on measurements of 59,526 women.

The tables which have been used quite generally since publication in 1912 are those of the Association of Life Insurance Medical Directors, presented here as table 32 for men and 33 for women. In developing these tables data were taken from policies issued during January of odd years, and July of even years from 1885 to 1900, inclusive. This was to average out the difference of "5 or 6 pounds" between winter and summer clothing of either men or women. Need for due allowance for season when making comparison of these with other data on a less comprehensive basis was indicated.

Data for men were based on values from 221,819 policies issued prior to 1900. Because there were only about 10,000 policies issued for women between 1885 and 1900, data for some 126,000 more women were obtained from four insurance companies on issues between 1900 and 1908; about two-thirds of them were from the New York Life Insurance Co.

TABLE 32.—MEN, MEDICO-ACTUARIAL STANDARDS: *Average weights for height and age, 1885-1900*¹

Age in years	Weight for height of—																	
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches	76 inches	77 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
15	107	109	112	115	118	122	126	130	134	138	142	147	152	157	162	167	172	177
16	109	111	114	117	120	124	128	132	136	140	144	149	154	159	164	169	174	179
17	111	113	116	119	122	126	130	134	138	142	146	151	156	161	166	171	176	181
18	113	115	118	121	124	128	132	136	140	144	148	153	158	163	168	173	178	183
19	115	117	120	123	126	130	134	138	142	146	150	155	160	165	170	175	180	185
20	117	119	122	125	128	132	136	140	144	148	152	156	161	166	171	176	181	186
21	118	120	123	126	130	134	138	141	145	149	153	157	162	167	172	177	182	187
22	119	121	124	127	131	135	139	142	146	150	154	158	163	168	173	178	183	188
23	120	122	125	128	132	136	140	143	147	151	155	159	164	169	175	180	185	190
24	121	123	126	129	133	137	141	144	148	152	156	160	165	171	177	182	187	192
25	122	124	126	129	133	137	141	145	149	153	157	162	167	173	179	184	189	194
26	123	125	127	130	134	138	142	146	150	154	158	163	168	174	180	186	191	196
27	124	126	128	131	134	138	142	146	150	154	158	163	168	175	181	187	192	197
28	125	127	129	132	135	139	143	147	151	155	159	164	169	176	182	188	193	198
29	126	128	130	133	136	140	144	148	152	156	160	165	170	177	183	189	194	199
30	126	128	130	133	136	140	144	148	152	156	160	165	170	177	183	189	194	199
31	127	129	131	134	137	141	145	149	153	157	161	166	171	178	184	190	196	201
32	127	129	131	134	137	141	145	149	153	157	162	167	172	179	185	191	197	202
33	127	129	131	134	137	141	145	149	153	157	162	167	172	179	186	192	198	203
34	128	130	132	135	138	142	146	150	154	159	164	169	175	181	187	193	199	204
35	128	130	132	135	138	142	146	150	155	160	165	170	176	182	188	194	200	206
36	128	130	132	135	138	142	146	150	155	160	165	170	176	182	189	195	201	207
37	129	131	133	136	139	143	147	151	156	161	166	171	177	183	190	196	202	208
38	129	131	133	136	140	144	148	152	157	162	167	172	178	184	191	197	203	209
39	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	198	204	210
40	130	132	134	137	140	144	148	152	157	162	167	173	179	185	192	199	205	211
41	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	206	212
42	131	133	135	138	141	145	149	153	158	163	168	174	180	186	193	200	207	213
43	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
44	132	134	136	139	142	146	150	154	159	164	169	175	181	187	194	201	208	214
45	133	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
46	133	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
47	133	135	137	140	143	147	151	155	160	165	170	176	182	188	195	202	209	215
48	134	136	138	141	144	148	152	156	161	166	171	177	183	189	196	203	210	216
49	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217

50	134	136	138	141	144	148	152	156	161	166	171	177	183	190	197	204	211	217
51	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
52	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
53	135	137	139	142	145	149	153	157	162	167	172	178	184	191	198	205	212	218
54	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219
55 and over	135	137	139	142	145	149	153	158	163	168	173	178	184	191	198	205	212	219

¹ Source: Association of Life Insurance Medical Directors and Actuarial Society of America (1912); weights and heights in ordinary indoor clothing, including shoes.

50	125	127	129	131	133	135	138	141	144	148	152	156	161	165	169	173	176
51	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
52	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
53	125	127	129	131	133	135	138	141	144	148	152	157	162	166	170	174	177
54	125	127	129	131	133	135	138	141	144	148	153	158	163	167	171	174	177
55 and over	125	127	129	131	133	135	138	141	144	148	153	158	163	167	171	174	177

¹ Source: Association of Life Insurance Medical Directors and Actuarial Society of America (1912); weights and heights in ordinary indoor clothing, including shoes.

TABLE 34.—MEN, WOOD'S STANDARDS: *Average weights for height and age, before 1923*¹

Age in years	Weight for height of—											
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches
19	111	116	122	127	130	134	139	142	147	152	155	159
20	112	117	123	128	131	135	140	143	148	153	156	160
21	114	118	124	129	132	136	141	144	149	154	157	161
22	115	119	125	130	134	138	142	145	150	155	158	162
23	116	120	126	131	135	139	143	146	151	156	159	164
24	117	121	127	132	136	140	144	148	152	157	160	165
25	118	122	128	133	137	141	145	149	153	158	161	166
26	119	123	129	134	138	142	146	150	155	160	163	168
27	120	124	130	135	139	143	147	151	156	161	164	169
28	121	125	131	136	140	144	148	152	157	162	165	170
29	122	126	132	137	141	145	149	153	158	163	166	171
30	123	127	133	138	142	146	150	154	159	164	167	172
31	124	128	134	139	143	147	151	155	160	165	168	173
32	125	129	135	140	144	148	152	156	161	166	169	174
33	126	130	136	141	145	149	153	157	162	167	170	175
34	127	131	137	142	146	150	154	158	163	168	171	176
35	128	132	138	143	147	151	155	159	164	169	172	177
36	129	133	139	144	148	152	156	160	165	170	173	178
37	130	134	140	145	149	153	157	161	166	171	174	179
38	131	135	141	146	150	154	158	162	167	172	175	180
39	132	136	142	147	151	155	159	163	168	173	176	181
40	133	137	143	148	152	156	160	164	169	174	177	182
41	134	138	144	149	153	157	161	165	170	175	178	183
42	135	139	145	150	154	158	162	166	171	176	179	184
43	136	140	146	151	155	159	163	167	172	177	180	185
44	137	141	147	152	156	160	164	168	173	178	181	186
45	138	142	148	153	157	161	165	169	174	179	182	187
46	139	143	149	154	158	162	166	170	175	180	183	188
47	140	144	150	155	159	163	167	171	176	181	184	189
48	141	145	151	156	160	164	168	172	177	182	185	190
49	142	146	152	157	161	165	169	173	178	183	186	191
50	143	147	153	158	162	166	170	174	179	184	187	192
51	144	148	154	159	163	167	171	175	180	185	188	193
52	145	149	155	160	164	168	172	176	181	186	189	194
53	146	150	156	161	165	169	173	177	182	187	190	195
54	147	151	157	162	166	170	174	178	183	188	191	196
55	148	152	158	163	167	171	175	179	184	189	192	197
56	149	153	159	164	168	172	176	180	185	190	193	198
57	150	154	160	165	169	173	177	181	186	191	194	199
58	151	155	161	166	170	174	178	182	187	192	195	200
59	152	156	162	167	171	175	179	183	188	193	196	201
60	153	157	163	168	172	176	180	184	189	194	197	202
61	154	158	164	169	173	177	181	185	190	195	198	203
62	155	159	165	170	174	178	182	186	191	196	199	204
63	156	160	166	171	175	179	183	187	192	197	200	205
64	157	161	167	172	176	180	184	188	193	198	201	206
65	158	162	168	173	177	181	185	189	194	199	202	207
66	159	163	169	174	178	182	186	190	195	200	203	208
67	160	164	170	175	179	183	187	191	196	201	204	209
68	161	165	171	176	180	184	188	192	197	202	205	210
69	162	166	172	177	181	185	189	193	198	203	206	211
70	163	167	173	178	182	186	190	194	199	204	207	212
71	164	168	174	179	183	187	191	195	200	205	208	213
72	165	169	175	180	184	188	192	196	201	206	209	214
73	166	170	176	181	185	189	193	197	202	207	210	215
74	167	171	177	182	186	190	194	198	203	208	211	216
75	168	172	178	183	187	191	195	199	204	209	212	217
76	169	173	179	184	188	192	196	200	205	210	213	218
77	170	174	180	185	189	193	197	201	206	211	214	219

¹ Source: "Personal Health Standard and Scale," by T. D. Wood, M.D., Bureau of Publications, Teacher's College, Columbia University (1923), used with their permission; weights are in indoor clothing including shoes, heights *without* shoes.

TABLE 35.—WOMEN, WOOD'S STANDARDS: *Average weights for height and age, before 1923*¹

Age in years	Weight for height of—														
	58 inches	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
19	104	106	112	116	118	120	123	126	130	135	138	142	144	146	150
20	106	107	112	116	118	121	124	127	131	135	138	142	144	147	152
21	108	109	113	116	119	122	125	128	132	135	139	142	145	149	154
22	110	112	115	118	120	123	126	129	133	137	141	145	148	151	156
23	111	113	116	119	121	124	128	131	135	139	143	147	151	154	158
24	113	115	117	120	122	124	127	131	134	138	142	146	150	154	158
25	116	118	122	125	127	130	134	138	142	146	150	154	157	160	163
26	119	121	123	125	127	130	134	138	142	146	150	154	157	160	163
27	123	125	127	129	132	135	138	142	146	150	154	158	161	164	167
28	126	128	130	132	135	138	141	145	149	153	157	161	164	168	171
29	129	131	133	135	138	141	144	148	152	156	161	165	169	173	176

TABLE 36.—MEN, BRITTEN AND THOMPSON'S STANDARDS: *Average weights for height and age, of industrial workers, 1914-21*¹

Age in years	Weight for height of—									
	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20-24-----	128	132	135	138	141	145	148	150	155	159
25-29-----	133	136	140	144	147	151	154	157	161	167
30-34-----	136	140	143	147	150	154	157	159	164	170
35-39-----	138	142	145	149	152	156	158	162	166	172
40-44-----	138	142	145	149	152	156	159	162	167	173
45-49-----	139	143	147	151	154	158	161	165	169	175

¹ Source: Britten and Thompson (1926); "American whites" from New York, New Jersey, Ohio, Pennsylvania, West Virginia, Illinois, Maryland, and Florida; heights and weights in ordinary indoor clothing including shoes.

Data for women, therefore, are for a somewhat later period than those for men.

Tables published by Gray and Gray (1917) and Davenport (1923) are these 1912 insurance tables and are so accredited in the publications. They are sometimes erroneously referred to as Davenport's tables.

Wood's data have been adapted by us in tables 34 and 35 to the form used in insurance tables to facilitate comparison. His tables were first published in the 1921 edition of Rose's Laboratory Handbook for Dietetics, then were revised and published as Wood's "Personal Health Standard and Scale" in 1923. The revised tables have appeared primarily in the nutrition publications from Teachers College of Columbia University. We have been unable to trace the source of the original data used in developing them. One difference in these tables from those from the insurance companies should be noted; weights include indoor clothing with shoes, but heights have been corrected for heels.

Britten and Thompson collected between 1914 and 1921 data on heights and weights of male industrial workers largely from the Northeastern States. The men were listed as "American White," but included many of foreign parentage. Their data, published in 1926, have been adapted by us in table 36 to the form used in the insurance tables. No general use of this table seems to have been made, and no corresponding scale for women has been published.

Data collected from insurance policies from 1907 to 1927 were published in the "Medical Impairment Study of 1929", by the Actuarial Society of America and Association of Life Insurance Medical Directors

(1931). Deviations in smoothed values in the new tables from those in the insurance tables of 1912 were no greater than 2 pounds for men 62 to 77 inches tall, or than 3 pounds for women 61 to 72 inches tall and even these were only in the 15 to 21 year groups. These small differences could possibly be due to differences in weight of clothes worn at the time of collection of the data. Greater deviations in weights were found for men and women in the 15 to 20 year ages who were 60 inches or less, but the number of such short people in this range is now so small that they are no longer included in general tables.

In 1937 and 1938 Dublin and Marks published data by weights for height and age of about 330,000 women taken from standard insurance policies issued by the Metropolitan Life Insurance Co. during 1922 and 1934 (table 37). More recent immigrants were included in this study than in the 1912 joint insurance company study. Also some restrictions had been placed on underweight at younger ages and on overweight at older ones. Weights were generally within ± 3 pounds of 1912 weights for height and age, although in a few cases greater differences were found.

In 1942 and 1943 the Statistical Bureau of the Metropolitan Life Insurance Co. published tables of desirable weights for adults 25 and over, originally designated as "ideal" weight tables, which were based on adjusted values of earlier insurance tables (table 38). In recognition of variations in bodily proportions the company has given ranges in weights for heights for persons of small, medium, and large frames, but without definition of the differences in frame size.

TABLE 37.—WOMEN, METROPOLITAN LIFE INSURANCE STUDY: *Average weights for height and age, 1922-34*¹

Age in years	Weight for height of—																
	56 inches	57 inches	58 inches	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
15-----	91	95	93	97	103	105	109	113	116	121	123	125	131	131	(²)	(²)	(²)
16-----	(²)	99	103	101	106	109	111	116	118	122	124	130	134	136	144	(²)	(²)
17-----	(²)	103	102	106	108	110	114	117	120	124	127	132	134	140	142	(²)	(²)
18-19-----	102	104	103	106	110	112	115	118	122	125	128	132	136	140	143	148	(²)
20-24-----	107	110	107	108	112	114	117	120	124	127	131	135	139	142	147	151	158
25-29-----	107	113	112	115	117	119	122	125	129	132	136	141	143	147	150	159	163
30-34-----	114	114	118	119	122	125	127	130	133	137	141	145	150	156	161	160	173
35-39-----	115	126	121	126	126	129	131	135	138	142	146	149	154	160	164	166	167
40-44-----	(²)	128	127	126	131	131	134	138	141	145	149	153	158	162	163	177	(²)
45-49-----	(²)	(²)	127	132	133	133	137	140	142	147	151	155	161	167	169	176	(²)
50-54-----	(²)	(²)	130	127	134	137	138	142	144	150	153	157	164	164	172	(²)	(²)
55 and over-----	(²)	(²)	127	124	136	135	139	142	145	151	153	158	162	166	171	(²)	(²)

¹ Source: Dublin and Marks (1938), unadjusted values from standard issues; heights and weights in ordinary indoor clothing including shoes.

² Averages were not computed because number of women measured was less than 20.

TABLE 38.—MEN AND WOMEN AGED 25 YEARS AND OVER. METROPOLITAN LIFE INSURANCE STANDARDS:
*Desirable weights for height and body frame*¹

Height in inches	Weights of men			Weights of women		
	Small frame	Medium frame	Large frame	Small frame	Medium frame	Large frame
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
59-----				104-111	110-118	117-127
60-----				105-113	112-120	119-129
61-----				107-115	114-122	121-131
62-----	116-125	124-133	131-142	110-118	117-125	124-135
63-----	119-128	127-136	133-144	113-121	120-128	127-138
64-----	122-132	130-140	137-149	116-125	124-132	131-142
65-----	126-136	134-144	141-153	119-128	127-135	133-145
66-----	129-139	137-147	145-157	123-132	130-140	138-150
67-----	133-143	141-151	149-162	126-136	134-144	142-154
68-----	136-147	145-156	153-166	129-139	137-147	145-158
69-----	140-151	149-160	157-170	133-143	141-151	149-162
70-----	144-155	153-164	161-175	136-147	145-155	152-166
71-----	148-159	157-168	165-180	139-150	148-158	155-169
72-----	152-164	161-173	169-185	141-153	151-163	160-174
73-----	157-169	166-178	174-190			
74-----	163-175	171-184	179-196			
75-----	168-180	176-189	184-202			

¹ Source: Metropolitan Life Insurance Company (1942, 1943, 1958); heights and weights in ordinary indoor clothing including shoes, 1 inch heels for men, 2 inch heels for women.

Data Accumulated Since 1938

Data on heights and weights of about 10,000 women were secured as part of a study of women's measurements for garment and pattern construction (O'Brien and Shelton 1941 and O'Brien n.p.). The data represent measurements for women from colleges, WPA workrooms, social welfare centers, and women's organizations in a few cities of Atlantic, Central, and Western areas. They were measured in light underwear only. As seen in table 39 no consistent differences were found in weights for heights among women from the three areas. No attempt was made to set up standards of heights and weights from these data, because the women did not constitute a representative sample although the measurements were carefully made.

In 1952 height-weight-age data based on new insurance values appeared as graphs in an advertisement in the Journal of the American Medical Association (Pfizer Spectrum 1952). These were based on tables of the Equitable Life Assurance Society of the United States, derived from data from insurance examinations of purchasers of ordinary policies during 1940. Copies of tables on which the graphs were based, furnished by Wilbur Smith, M.D. of that company, are reproduced as tables 40 and 41.

In these tables weights for height and age of men are generally greater than those in earlier tables, except for tall men; and weights of women are generally less than in earlier tables. These tables have not been published as standards, although they were probably as representative of the insured population as were the earlier insurance tables.

See the "Addendum," page 109, for data on the average heights and weights of about five million men and women as reported on applications for life insurance. These data were published by the Society of Actuaries (1959) just as the manuscript for this bulletin was completed.

Another mass of height-weight-age data is that for about 160,000 students entering 100 colleges in 1948-50, collected by the American College Health Association (n.p.) and tabulated and analyzed for this publication by the U.S. Department of Agriculture. These data are presented in table 42 for men and table 43 for women. The students were measured without clothing, or corrections made for light garments. The data are presented on a regional basis, although it is recognized that true regional classification for this group cannot be made. Many students cross census regional lines for college, but

TABLE 39.—WOMEN, O'BRIEN STUDY: *Average weights for height and age, 1939-40*¹

Age in years	Area ²	Weight for height of—								
		59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches
		<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
18-19-----	Atlantic-----	107	114	113	117	121	123	131	132	³ 136
	Central-----	(⁴)	³ 109	119	112	117	121	131	³ 129	³ 138
	Pacific-----	(⁴)	(⁴)	³ 117	³ 122	³ 118	³ 123	³ 130	³ 127	(⁴)
20-24-----	Atlantic-----	111	116	116	120	123	127	125	133	142
	Central-----	³ 102	111	118	115	122	125	128	134	³ 138
	Pacific-----	³ 110	111	114	125	122	124	124	134	133
25-29-----	Atlantic-----	116	117	119	125	125	128	130	139	138
	Central-----	³ 108	³ 126	115	122	119	125	129	133	³ 131
	Pacific-----	³ 121	113	113	124	126	126	126	132	³ 143
30-34-----	Atlantic-----	126	123	126	128	134	127	132	138	140
	Central-----	³ 117	122	123	124	132	139	132	³ 133	³ 137
	Pacific-----	³ 121	119	130	128	124	130	138	133	³ 134
35-39-----	Atlantic-----	132	136	133	132	135	138	142	142	³ 146
	Central-----	³ 126	128	136	128	133	139	136	³ 136	³ 151
	Pacific-----	³ 127	127	122	131	131	131	141	151	³ 144
40-44-----	Atlantic-----	139	138	136	144	143	150	151	146	³ 154
	Central-----	³ 119	³ 121	130	132	143	146	³ 155	³ 136	(⁴)
	Pacific-----	³ 124	³ 141	138	140	138	140	145	³ 147	³ 165
45-49-----	Atlantic-----	137	139	147	152	150	151	157	160	³ 159
	Central-----	³ 127	³ 131	144	132	142	159	154	³ 150	(⁴)
	Pacific-----	³ 136	³ 138	139	134	142	151	157	³ 156	³ 149
50-54-----	Atlantic-----	137	145	150	151	165	157	³ 152	³ 154	(⁴)
	Central-----	³ 126	³ 150	151	³ 146	148	147	³ 146	³ 170	(⁴)
	Pacific-----	³ 138	³ 143	134	143	161	154	159	³ 165	(⁴)
55-59-----	Atlantic-----	138	146	145	148	153	157	151	³ 168	(⁴)
	Central-----	³ 141	³ 135	³ 138	144	³ 141	³ 144	³ 158	³ 148	(⁴)
	Pacific-----	³ 123	³ 144	145	150	149	³ 149	³ 157	³ 167	(⁴)
60-64-----	Atlantic-----	134	148	148	³ 150	148	³ 148	(⁴)	(⁴)	(⁴)
	Central-----	(⁴)	(⁴)	(⁴)	³ 131	³ 145	³ 168	(⁴)	(⁴)	-----
	Pacific-----	(⁴)	(⁴)	³ 138	³ 138	³ 151	³ 154	³ 163	(⁴)	(⁴)

¹ Source: O'Brien (n.p.): measured without clothing.² Atlantic area includes data from New Jersey, Pennsylvania, Maryland, District of Columbia and North Carolina; Central area from Illinois and Arkansas; and Pacific area from California; but not all States are represented in all age groups.³ Only 10 to 19 women were measured.⁴ Averages omitted because only 1 to 9 women were measured.

TABLE 40.—MEN, EQUITABLE LIFE ASSURANCE STUDY: *Average weights for height and age, 1940*¹

Age in years	Weight for height of—													
	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches	76 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
15-----	113	118	123	128	133	138	143	148	153	158	163	168	172	175
16-----	117	121	126	131	136	141	146	151	155	160	164	168	172	177
17-----	120	124	129	134	139	144	149	153	157	161	165	169	172	177
18-----	124	127	131	136	141	146	150	154	158	163	167	171	174	177
19-----	127	130	134	138	143	147	151	155	159	164	168	172	176	180
20-----	130	133	136	140	144	148	152	156	160	165	169	173	177	181
21-----	131	134	137	141	145	149	153	157	161	166	170	174	178	182
22-----	131	134	137	141	145	149	153	157	162	167	172	176	180	184
23-----	132	135	138	142	146	150	154	158	163	168	173	178	182	186
24-----	133	136	139	143	147	151	155	159	164	169	174	179	183	187
25-----	134	137	140	144	148	152	156	160	165	170	175	180	184	188
26-----	135	138	141	145	149	153	157	161	166	171	176	180	184	188
27-----	136	139	142	146	150	154	158	162	167	172	177	181	185	189
28-----	137	140	143	147	151	155	159	163	168	173	178	182	186	190
29-----	137	140	144	148	152	156	160	164	169	174	179	183	187	191
30-----	138	141	145	149	153	157	161	165	170	175	180	184	188	192
31-----	138	141	145	149	153	157	161	166	171	176	181	185	189	193
32-----	139	142	146	150	154	158	162	167	172	177	182	186	190	194
33-----	139	142	146	150	154	158	162	167	172	177	182	186	190	194
34-----	140	143	147	151	155	159	163	168	173	178	183	187	191	195
35-----	140	143	147	151	155	159	163	168	173	178	183	188	192	196
36-----	141	144	148	152	156	160	164	169	174	179	184	189	193	197
37-----	141	145	149	153	157	161	165	170	175	180	185	190	194	198
38-----	141	145	149	153	157	161	165	170	175	180	185	190	194	198
39-----	142	146	150	154	158	162	166	171	176	181	186	191	195	199
40-----	142	146	150	154	158	162	166	171	176	181	186	191	195	199
41-----	143	147	151	155	159	163	167	172	177	182	187	191	195	199
42-----	143	147	151	155	159	163	167	172	177	182	187	191	195	199
43-----	143	147	151	155	159	163	167	172	177	182	187	191	195	199
44-----	144	148	152	156	160	164	168	173	178	183	188	192	196	200
45 and over-----	144	148	152	156	160	164	168	173	178	183	188	192	196	200

¹Source: From Wilbur A. Smith, M.D., Equitable Life Assurance Society of the United States (n.p.); graphs of data published in Pfizer Spectrum (1952); weights in ordinary indoor clothing except coats and vests, heights with shoes.

TABLE 41.—WOMEN, EQUITABLE LIFE ASSURANCE STUDY: *Average weights for height and age, 1940*¹

Age in years	Weight for height of—										
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
15-----	103	106	110	114	118	121	125	129	133	137	142
16-----	106	109	112	116	119	122	126	130	134	138	143
17-----	108	111	114	117	120	123	126	130	134	139	144
18-----	109	112	115	118	121	124	127	131	135	140	145
19-----	109	112	115	118	121	124	127	131	135	140	145
20-----	109	112	115	118	121	124	127	131	135	140	145
21-----	110	113	116	119	122	125	128	132	136	141	146
22-----	110	113	116	119	122	125	128	132	136	141	146
23-----	110	113	116	119	122	125	128	132	136	141	146
24-----	111	114	117	120	123	126	129	133	137	142	147
25-----	111	114	117	120	123	126	129	133	137	142	147
26-----	112	115	118	121	124	127	130	134	138	142	147
27-----	112	115	118	121	124	127	130	134	138	142	147
28-----	113	116	119	122	125	128	131	135	139	143	148
29-----	113	116	119	122	125	128	131	135	139	143	148
30-----	114	117	120	123	126	129	132	136	140	144	149
31-----	114	117	120	123	126	129	132	136	140	144	149
32-----	115	118	121	124	127	130	133	137	141	145	150
33-----	116	119	122	125	128	131	134	138	142	146	151
34-----	116	119	122	125	128	131	134	138	142	147	152
35-----	117	120	123	126	129	132	135	139	143	148	153
36-----	118	121	124	127	130	133	136	140	144	149	154
37-----	119	122	125	128	131	134	137	141	145	150	155
38-----	120	123	126	129	132	135	138	142	146	151	156
39-----	121	124	127	130	133	136	139	143	147	152	157
40-----	122	125	128	131	134	137	140	144	148	153	158
41-----	123	126	129	132	135	138	141	145	149	154	159
42-----	124	127	130	133	136	139	142	146	150	155	160
43-----	125	128	131	134	137	140	143	147	151	156	161
44-----	127	130	133	136	139	142	145	149	153	158	163
45 and over	129	132	135	138	141	144	147	151	155	160	165

¹ Source: Wilbur A. Smith, M.D., Equitable Life Assurance Society of the United States (n.p.); graphs of data published in Pfizer Spectrum (1952); weights in ordinary indoor clothing, heights with shoes.

TABLE 42.—MEN, ACHA STUDY: *Average weights for height and age by regions, 1948-50*¹

Age and region	Weight for height of—										
	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
17 years:											
Northeast.....	131	139	141	146	152	154	159	162	166	168	169
North Central.....	133	138	141	146	151	154	158	161	166	169	180
South.....	135	134	139	143	147	150	156	160	164	169	176
West.....	135	137	139	142	146	152	159	160	167	170	² 166
United States ³	133	138	141	145	150	153	158	161	166	169	174
18 years:											
Northeast.....	134	140	144	148	151	155	160	162	168	170	172
North Central.....	135	140	143	147	151	155	159	162	166	170	174
South.....	134	137	141	145	148	153	158	159	167	167	179
West.....	131	137	143	146	150	153	158	161	162	172	178
United States ³	134	139	143	147	150	154	159	162	166	170	175
19 years:											
Northeast.....	137	141	143	149	154	157	163	164	171	173	174
North Central.....	134	140	143	149	153	157	160	162	168	171	178
South.....	133	138	141	146	150	153	159	164	167	167	173
West.....	135	139	143	146	154	154	161	162	165	171	174
United States ³	135	140	143	148	153	156	161	163	168	171	175
20-24 years:											
Northeast.....	141	144	148	152	156	160	164	168	174	178	183
North Central.....	139	143	147	151	154	159	162	166	170	174	179
South.....	137	140	144	148	151	155	162	164	170	171	175
West.....	135	141	146	149	154	158	162	165	170	174	173
United States ³	138	142	147	150	154	158	162	165	171	174	178
25-29 years:											
Northeast.....	140	145	148	154	160	164	168	174	177	183	² 180
North Central.....	139	144	150	153	156	163	168	170	174	180	182
South.....	138	142	147	152	155	160	160	168	165	175	183
West.....	137	143	148	153	157	160	163	169	173	178	178
United States ³	138	144	149	153	157	162	165	170	172	179	180
30-39 years:											
Northeast.....	(⁴)	148	149	156	163	160	162	176	² 177	(⁴)	-----
North Central.....	140	147	152	159	164	163	169	177	180	175	² 191
South.....	² 153	150	152	154	156	163	166	170	175	183	(⁴)
West.....	142	147	149	156	163	163	166	170	175	180	² 188
United States ³	143	148	151	157	162	163	167	173	178	179	189
40 years and over:											
United States ^{3 5}	147	156	159	162	161	169	177	176	² 192	² 196	(⁴)

¹ Source: American College Health Association Research Committee (n.p.); measured without clothing.² Only 10 to 19 men were measured.³ Weighted means.⁴ Average omitted because only 1 to 9 men were measured.⁵ Too few subjects to present regional values.

TABLE 43.—WOMEN, ACHA STUDY: *Average weights for height and age by regions, 1948-50*¹

Age and region	Weight for height of—										
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
17 years:											
Northeast.....	113	118	120	124	126	129	133	136	139	141	148
North Central.....	109	114	118	121	124	128	131	133	140	143	145
South.....	109	109	113	118	121	121	127	130	137	135	144
West.....	105	112	117	120	124	126	129	133	137	144	145
United States ²	110	114	117	121	124	127	131	134	138	141	146
18 years:											
Northeast.....	111	117	118	121	125	128	132	136	139	143	149
North Central.....	110	115	117	120	123	127	130	134	138	141	143
South.....	108	110	113	116	120	123	126	131	133	134	144
West.....	107	114	116	119	121	127	130	131	134	141	143
United States ²	110	115	116	119	123	126	130	133	137	140	145
19 years:											
Northeast.....	113	114	119	122	124	127	131	135	137	144	142
North Central.....	111	115	116	120	123	126	130	134	139	143	143
South.....	111	111	114	118	120	122	126	131	134	138	³ 143
West.....	112	111	115	119	123	125	131	136	137	139	143
United States ²	111	114	116	120	122	125	130	134	137	141	143
20-24 years:											
Northeast.....	112	114	118	122	125	128	133	135	139	146	149
North Central.....	110	112	117	120	125	127	130	134	137	144	143
South.....	108	113	112	115	121	125	129	131	134	140	145
West.....	107	115	117	120	123	126	129	133	137	142	147
United States ²	110	113	116	120	124	127	131	134	137	143	147
25-29 years:											
Northeast.....	(⁴)	³ 104	118	117	125	³ 141	137	(⁴)	(⁴)	(⁴)	(⁴)
North Central.....	117	116	118	127	124	128	135	138	140	³ 148	³ 153
South.....	³ 117	(⁴)	122	123	124	125	134	144	³ 134	(⁴)	(⁴)
West.....	116	115	119	120	124	127	134	133	137	³ 153	³ 148
United States ²	116	116	119	123	124	129	135	137	138	146	149
30-39 years:											
Northeast.....	(⁴)	³ 112	³ 128	³ 132	127	³ 133	(⁴)	(⁴)	(⁴)	(⁴)	-----
North Central.....	111	119	121	123	130	132	143	144	144	³ 137	(⁴)
South.....	³ 106	(⁴)	124	³ 123	122	³ 121	138	(⁴)	(⁴)	(⁴)	(⁴)
West.....	115	117	117	123	128	128	135	133	141	(⁴)	(⁴)
United States ²	112	118	120	124	129	129	139	140	142	143	³ 164
40 years and over:											
United States ^{2 5}	122	132	131	136	139	140	146	152	149	³ 178	(⁴)

¹ Source: American College Health Association Research Committee (n.p.); measured without clothing.² Weighted means.³ Only 10 to 19 women were measured.⁴ Average omitted because only 1 to 9 women were measured.⁵ Too few subjects to present regional values.

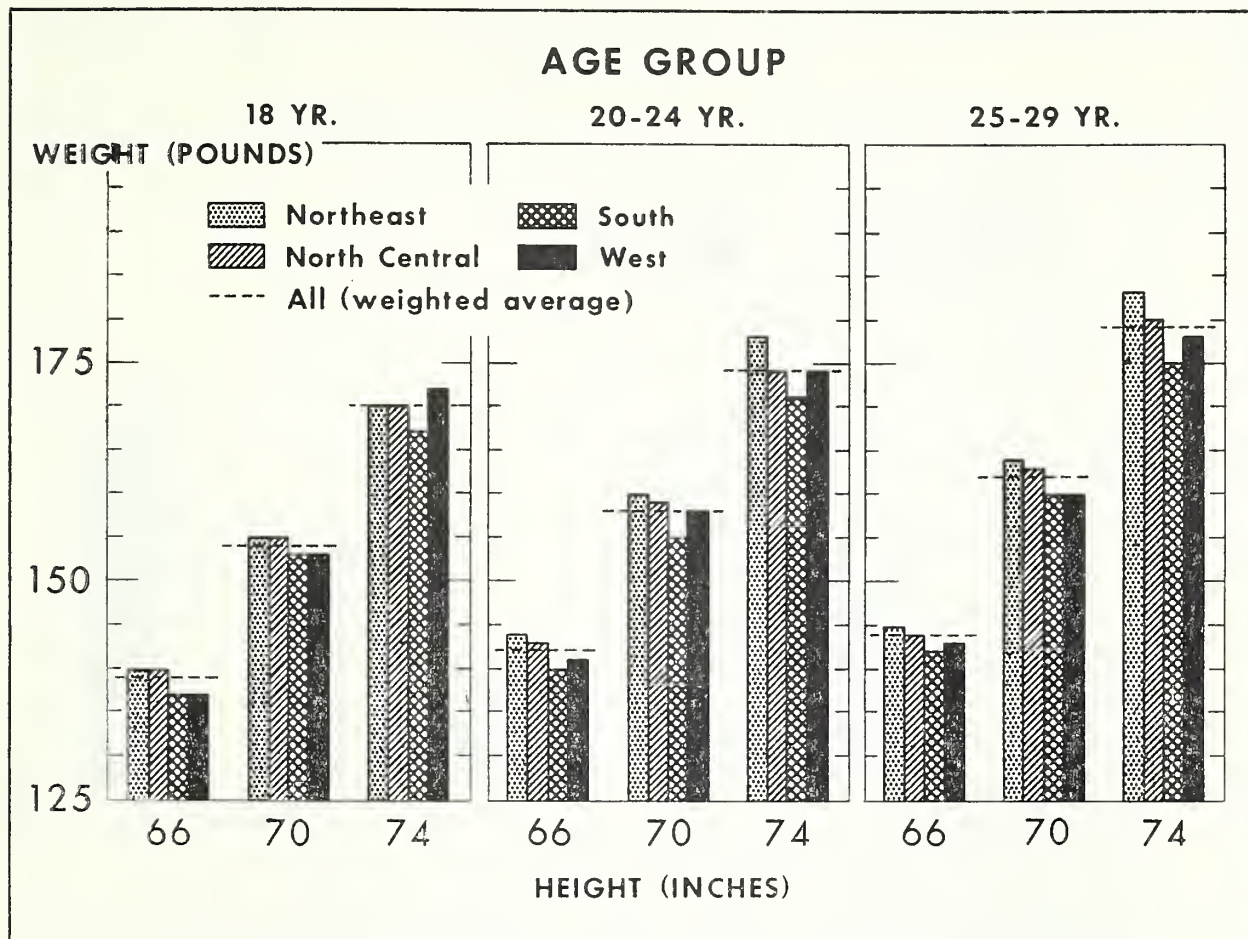


FIGURE 12.—Weights for height for three age groups of men by geographic regions: ACHA Study, 1948-50.

in general most of them, at least in State colleges, come from the region in which the college is located.

As shown in figures 12 and 13 there is a tendency for men and women from the North to be somewhat heavier and those from the South to be somewhat lighter in weight for height than those from the North Central and West, although these tendencies are not marked nor are they consistent at all heights and ages. Figures 14 and 15 show a general tendency to increase in weight with age as well as with increased height. This tendency is more marked for men than for women, particularly for those in their early 20's.

In 1950 the U.S. Public Health Service carried

out a multiple screening project on 182,207 persons from 15 to 59 years of age in Atlanta, Ga. (U.S. Public Health Service 1954, Abraham n.p.). When white and Negro subjects were separated as in tables 44 and 45, and figures 16 and 17, it was obvious that the Negro women were heavier in all age groups than the white women of corresponding heights. Differences between white and Negro men were minor; in men 45 years and older the white men slightly exceeded the Negro men in weight at some heights.

Average heights and weights of white and Negro college women in the vicinity of Washington, D.C. were available from the ACHA College study: white

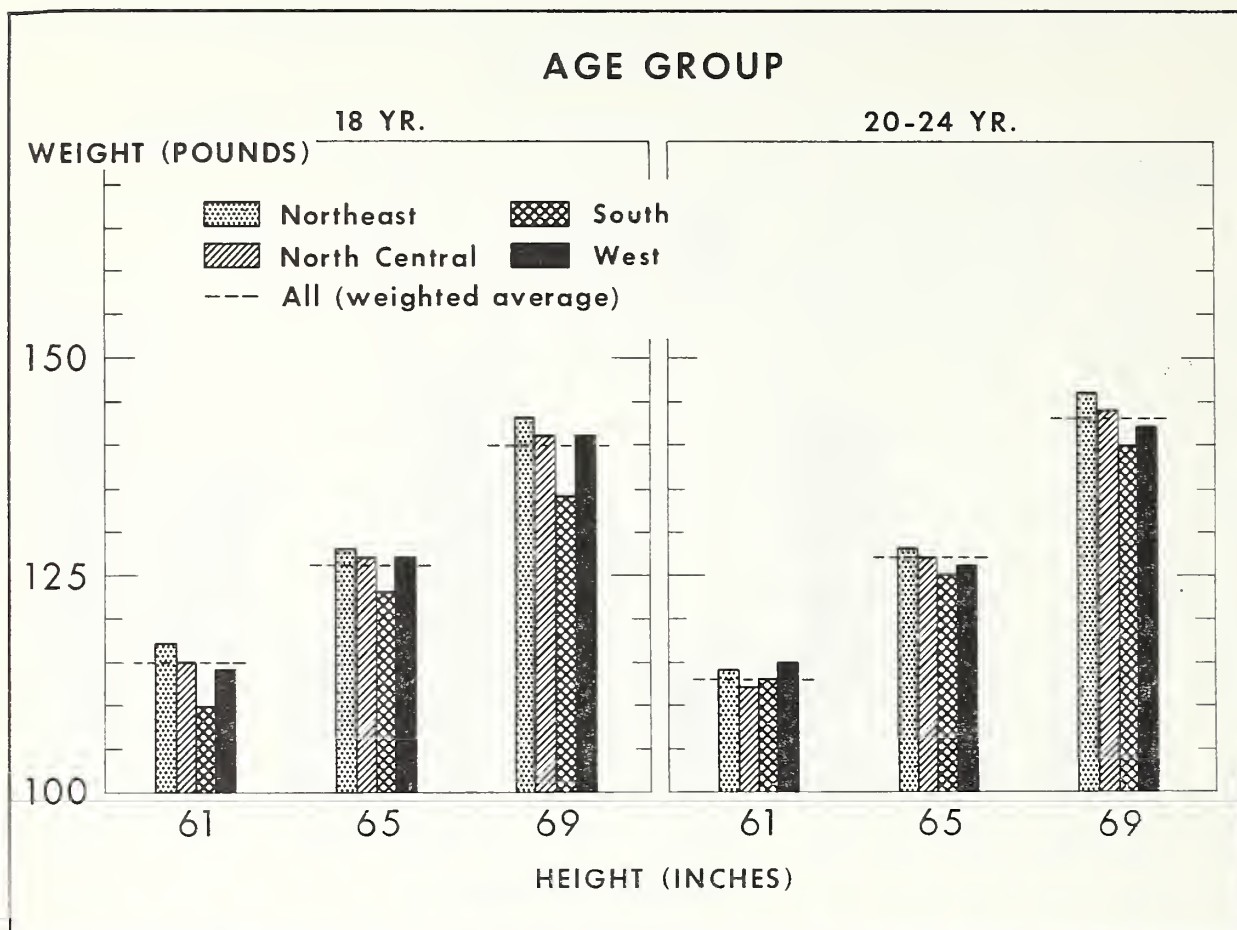


FIGURE 13.—Weights for height for two age groups of women by geographic regions: ACHA Study, 1948-50.

women from the University of Maryland, Mary Washington College, the University of West Virginia, and West Virginia Wesleyan University, and Negro women from Howard University and Miner Teacher's College (D.C.), table 46. Variation in measurements among the women in these four colleges for white students were as great as those between white and Negro students. Among the Negro students the largest number were about 64 inches tall. The average weight for this group from the two colleges was 123 pounds, the same weight as found for all the United States for this height in the ACHA Study. This would indicate that with similar economic and educational background, weights for heights of Negro women are similar to those of white women.

In addition to these data from groups of adults for whom actual measurements were made, three sets of data are available in which heights and weights were estimated by respondents for themselves, and in two of them for other members of their families. It is recognized that these data are

less accurate than measured data, but they do contribute a fair estimate of the trends of the times. Data are presented in table 47 for women from the Iowa-South Dakota Survey of 1948-51 (Swanson n.p. and Burrill n.p.), in tables 48 and 49 for both men and women from the 1948 USDA Survey (Clark and others 1954), and in tables 50 and 51 for both men and women from the 1955 USDA Survey (USDA 1956).

A description of the methods of sampling for the Iowa-South Dakota and 1955 USDA Surveys is presented in section I. In the 1948 USDA Survey of food consumption of households of urban families in the United States a sample of 1,558 families was interviewed, representative of all housekeeping families of two or more persons living in urban communities of the United States. Sixty-eight urban places were visited, selected by a method to assure the appropriate region and city size distribution. Nonparticipation of eligibles was minor. Height-weight data were reported for boarders and

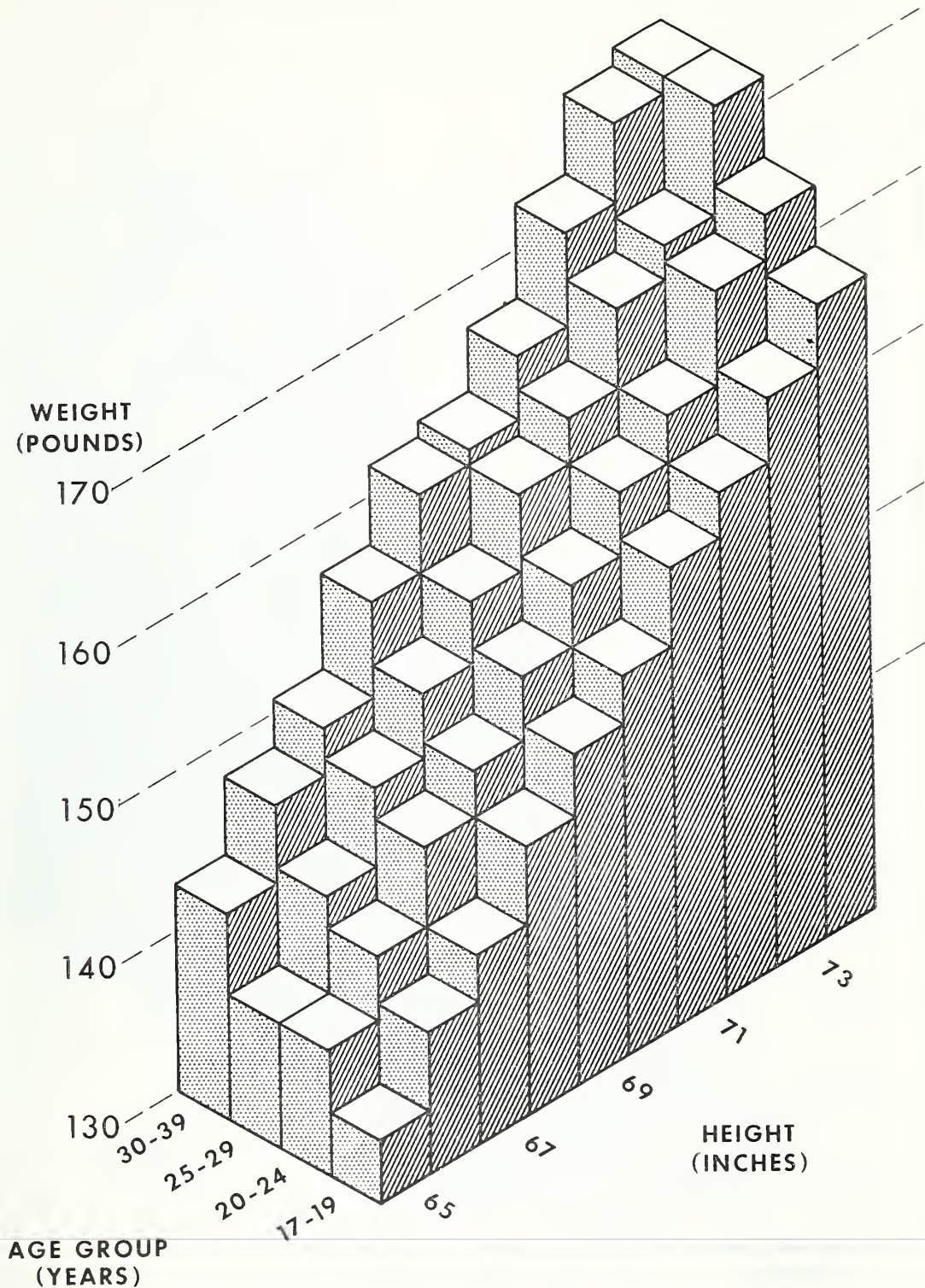


FIGURE 14.—Weights for height for four age groups of men, all United States: ACHA Study, 1948-50.

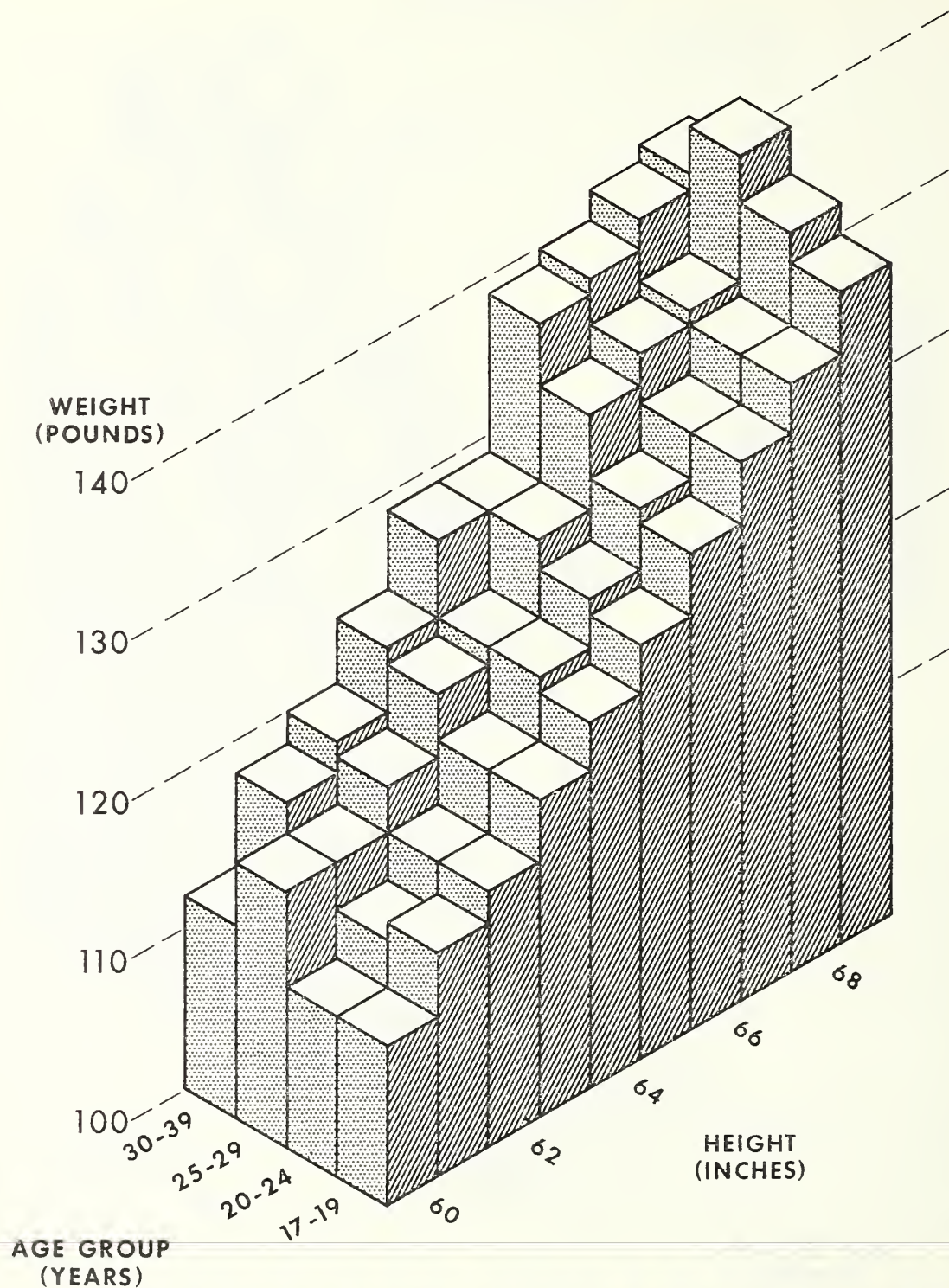


FIGURE 15.—Weights for height for four age groups of women, all United States: ACHA Study, 1948-50.

TABLE 44.—WHITE AND NEGRO MEN, ATLANTA, GA., STUDY: *Average weights for height and age, 1950*¹

Race and age in years	Weight for height of—														
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches
White:	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	104	108	114	119	120	129	134	140	145	149	154	158	163	167	171
	15-24	145	131	135	139	141	147	151	155	159	166	169	173	177	181
	25-34	2 146	141	141	139	145	147	152	156	161	166	169	173	178	185
	35-44	143	143	144	146	148	152	159	163	167	172	177	183	187	193
Negro:	148	134	134	143	144	149	153	157	164	166	172	175	178	183	193
	15-24	115	121	118	123	129	133	144	148	152	157	159	165	171	173
	25-34	130	138	140	140	145	149	155	157	162	167	171	175	177	186
	35-44	2 145	135	139	143	146	152	154	158	164	169	173	179	184	187
	45-54	136	145	137	144	148	152	157	159	165	172	179	183	184	197
Negro:	138	130	139	136	141	150	154	156	161	166	171	177	177	179	2 197
	15-24	115	121	118	123	129	133	144	148	152	157	159	165	171	173
	25-34	130	138	140	140	145	149	155	157	162	167	171	175	177	186
	35-44	2 145	135	139	143	146	152	154	158	164	169	173	179	184	187
	45-54	136	145	137	144	148	152	157	159	165	172	179	183	184	197
Negro:	138	130	139	136	141	150	154	156	161	166	171	177	177	179	2 197

¹ Source: U.S. Public Health Service data from S. Abraham (n.p.); weights and heights in ordinary clothing including shoes.

² Only between 10 and 20 men were measured.

TABLE 45.—WHITE AND NEGRO WOMEN, ATLANTA, GA., STUDY: *Average weights for heights and age, 1950*¹

Race and age in years	Weight for height of—														
	58 inches	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches
White:	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
	109	106	109	110	114	116	119	122	125	128	131	134	138	145	145
	15-24	112	117	117	120	122	125	129	131	133	136	140	145	148	157
	25-34	2 119	122	124	127	131	133	136	140	143	146	154	157	165	163
	35-44	122	123	133	131	135	141	143	147	150	154	155	165	165	171
Negro:	128	128	129	136	137	140	142	146	148	151	154	157	166	165	171
	15-24	107	115	116	119	123	128	132	136	138	143	144	153	162	159
	25-34	122	132	131	135	139	141	144	153	155	159	158	170	168	174
	35-44	142	138	140	147	148	151	156	161	167	170	172	177	179	174
	45-54	141	140	145	149	153	155	162	167	172	172	178	181	179	174
Negro:	148	136	140	147	152	150	155	159	161	164	169	177	177	179	174
	15-24	107	115	116	119	123	128	132	136	138	143	144	153	162	159
	25-34	122	132	131	135	139	141	144	153	155	159	158	170	168	174
	35-44	142	138	140	147	148	151	156	161	167	170	172	177	179	174
	45-54	141	140	145	149	153	155	162	167	172	172	178	181	179	174
Negro:	148	136	140	147	152	150	155	159	161	164	169	177	177	179	174

¹ Source: U.S. Public Health service data from S. Abraham (n.p.); weights and heights in ordinary clothing including shoes.

² Only between 10 and 20 women were measured.

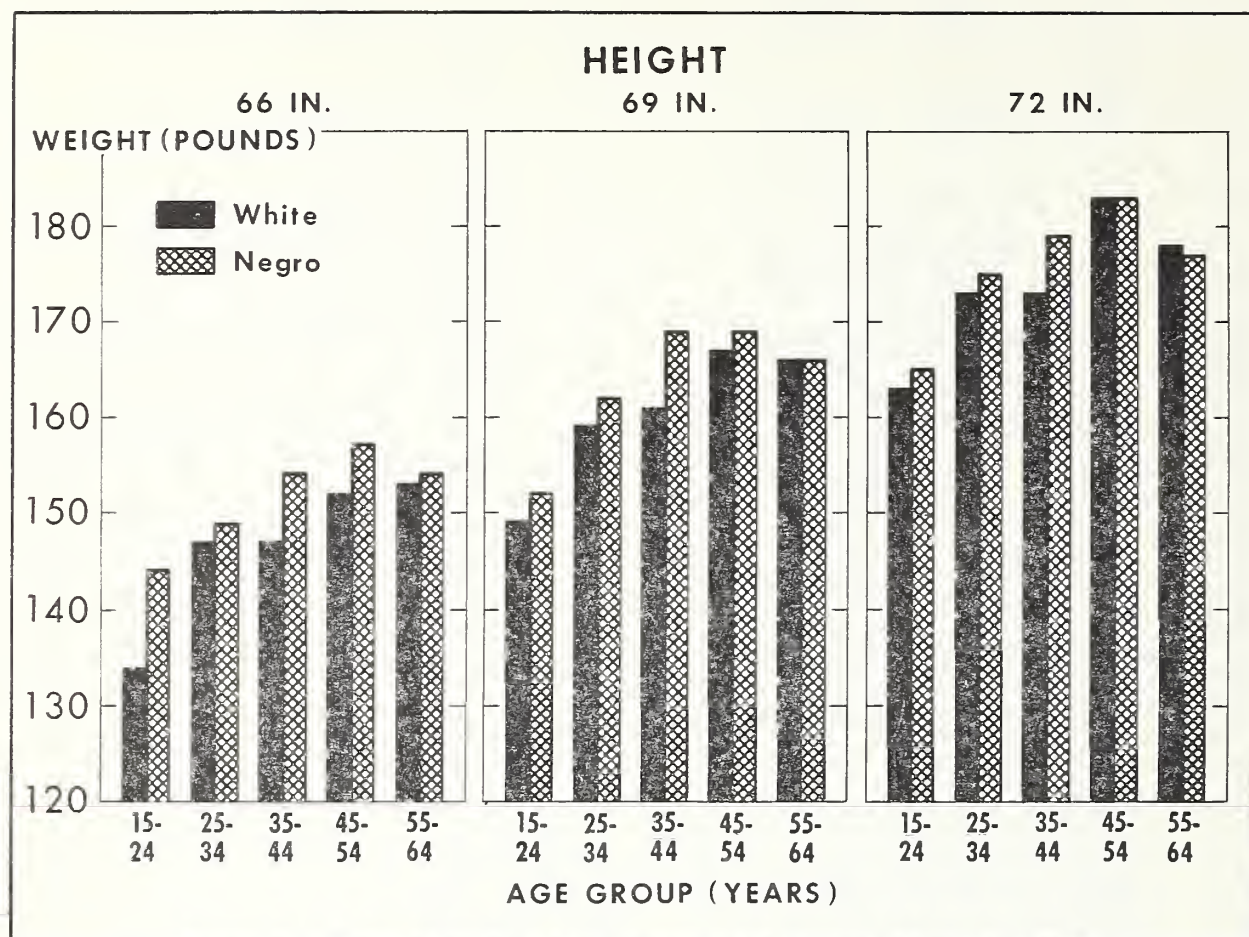


FIGURE 16.—Weights for height and age of white and Negro men, Atlanta, Ga., 1950.

TABLE 46.—WHITE AND NEGRO COLLEGE WOMEN, ACHA STUDY: *Average heights and weights in the vicinity of Washington, D.C., 1950*¹

Race and age in years	Univ. of Maryland			Mary Washington			Univ. of W. Va.			W. Va. Wesleyan Univ.		
	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight	Cases	Height	Weight
	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
White:												
17-----	132	63.8	124.4	243	64.3	119.4	88	64.6	128.2	28	63.9	126.9
18-----	164	63.9	121.5	248	64.5	120.5	156	64.3	122.7	48	64.4	125.2
19-----	51	64.0	119.3	40	64.6	121.4	20	65.4	130.6	40	64.2	125.1
20-24----	25	64.6	120.4	16	64.6	125.4	14	65.6	129.5	64	64.1	124.2
25-29----	4	62.8	135.8	3	61.7	131.3	1	63.0	122.0	9	64.4	131.9
30-39----	2	65.0	126.5	2	62.5	112.0				2	63.5	118.0
				Howard University			Miner Teacher's College					
Negro:												
17-----				55	64.0	118.7	38	64.0	125.5			
18-----				98	64.2	126.3	93	63.8	122.6			
19-----				40	64.6	127.1	71	63.8	123.1			
20-24----				41	63.8	123.4	141	64.0	124.8			
25-29----				21	63.6	126.6	11	64.5	125.7			
30-39----				8	63.1	134.4	6	64.3	136.3			

¹ Source: American College Health Association (n.p.): University of Maryland (College Park); Mary Washington (Fredericksburg, Va.); University of West Virginia (Morgantown); West Virginia Wesleyan College (Buckhannon); and Howard University and Miner Teacher's College (Washington, D.C.).

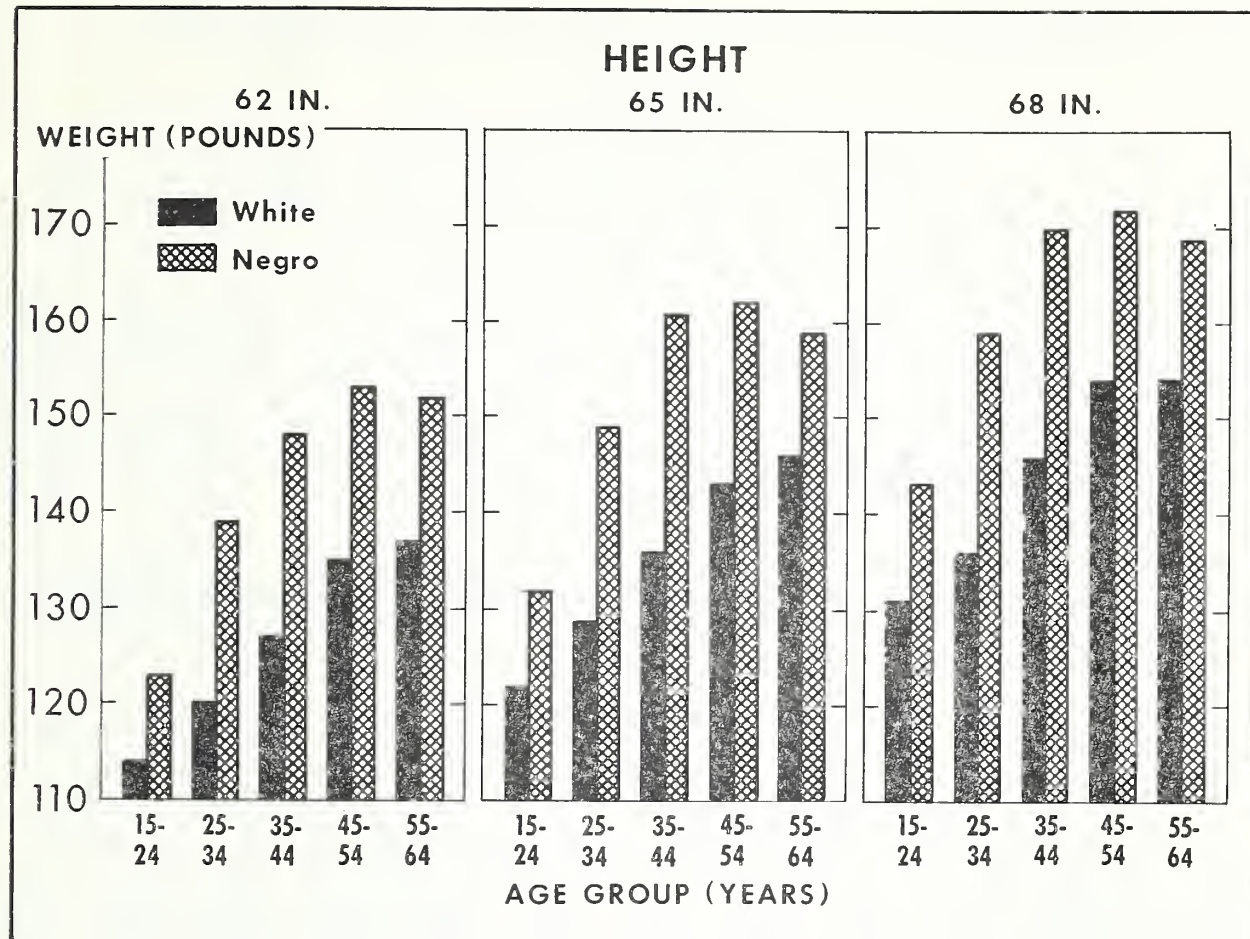


FIGURE 17.—Weights for height and age of white and Negro women, Atlanta, Ga., 1950.

household help as well as for family members. (Only data for family members 20 years and over have been used in this tabulation.) Unfortunately no attempt was made to check on what basis measurements were estimated, that is, whether without clothing or with shoes or other clothing.

The numbers of persons in some age-height groups were relatively small in these studies, and where less than 20 persons were in an age-height group it is so indicated in the tables.

Distribution of Weights for Height and Age

Average weights for given heights at various ages indicate that as Americans become older they become heavier at least to age 50–59 years, but these weights give no information on their distribution within or differences among the various age groups. Data presented in tables 52 to 55 show percentage distribution of weights by 10-pound intervals, for heights and age groups from the ACHA Study and from the

1955 USDA Survey. Five 10-pound-weight intervals beside the end categories were used for each height.

Average weights of college men from the ACHA Study (table 42) increased about 5 pounds between 17 years and 20–24 years, another 5 pounds between 20–24 and 30–39 years, and about 6 pounds after 40 years. Increases for men under 25 years are to be expected, since many boys do not reach weights consistent with the heights attained in adolescence until their early 20's. As seen in table 52, however, of the men 70 inches tall, 47, 35, 27, and 17 percent in the respective age groups weighed less than 150 pounds. At the other end of the range 9, 13, 21, and 31 percent of those in the four age groups weighed over 180 pounds. Distributions of similar nature were found at other heights.

For the college women in the ACHA Study (table 53) average weights were practically the same at ages 17, 18, 19, and 20–24 years (table 43). Average increased between 20–24 and 30–39 years were usually 4 or 5 pounds. Weights of women 40 years

TABLE 47.—WOMEN, IOWA-SOUTH DAKOTA: *Average weights for height and age, 1948-51*¹

Age in years	Weight for height of—								
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
30-39-----	² 132	² 127	133	132	139	148	139	156	171
40-49-----	² 136	135	137	150	145	148	148	159	² 158
50-59-----	² 137	² 127	150	152	154	156	154	173	(³)
60-69-----	(³)	(³)	146	149	138	159	150	150	(³)
70-79-----	² 128	(³)	² 136	135	137	² 158	141	(³)	(³)

¹ Sources: Swanson (n.p.) and Burrill (n.p.); measurements in ordinary indoor clothing, but without shoes.² Only 10 to 19 women of this height and age range.³ Average omitted because only 1 to 9 women of this height and age range.TABLE 48.—MEN, USDA URBAN SURVEY: *Average weights for height and age, food consumption survey of urban families, 1948*¹

Age in years	Weight for height of—										
	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
20-29-----	² 145	(³)	152	159	154	156	162	168	167	² 176	² 176
30-39-----	² 152	² 155	157	152	162	168	167	169	176	196	² 184
40-49-----	² 159	² 153	159	157	160	166	168	176	173	² 182	² 181
50-59-----	² 148	² 157	155	160	164	167	169	169	181	(³)	(³)
60-69-----	² 150	(³)	157	(³)	166	162	161	² 173	² 178	(³)	(³)

¹ Measurement methods not specified.² Only 10 to 19 men of this height and age range.³ Average omitted because only 1 to 9 men of this height and age range.TABLE 49.—WOMEN, USDA URBAN SURVEY: *Average weights for height and age, food consumption survey of urban families, 1948*¹

Age in years	Weight for height of—								
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
20-29-----	117	121	123	123	128	131	131	² 142	² 138
30-39-----	121	125	126	136	134	134	141	143	² 149
40-49-----	² 132	131	139	143	139	147	150	² 148	² 160
50-59-----	142	² 140	156	145	148	154	153	157	² 163
60-69-----	(³)	² 140	141	140	142	153	² 151	² 147	(³)

¹ Measurement methods not specified.² Only 10 to 19 women of this height and age range.³ Average omitted because only 1 to 9 women of this height and age range.

TABLE 50.—MEN, USDA SURVEY (ALL U.S.): *Average weights for height and age, Household Food Consumption Survey, 1955*

Age in years	Weight for height of— ¹										
	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20-24-----	² 147	² 150	146	151	154	155	159	163	170	173	² 174
25-29-----	² 146	(³)	155	155	161	163	167	167	175	182	187
30-34-----	(³)	² 148	152	159	164	166	169	175	178	182	192
35-39-----	² 152	152	156	163	166	167	172	177	182	186	195
40-44-----	² 145	159	161	161	164	165	171	179	185	182	² 187
45-49-----	² 151	159	153	167	168	169	170	179	185	² 181	² 191
50-54-----	² 148	161	161	160	168	177	167	176	181	² 187	² 191
55-59-----	² 148	155	160	162	166	171	170	179	174	² 190	(³)
60-64-----	² 156	² 154	157	162	163	162	171	177	179	(³)	(³)
65-69-----	² 149	² 147	154	162	163	156	164	173	173	² 180	(³)
70 +-----	² 148	148	148	155	156	159	159	² 176	164	² 175	(³)

¹ Heights without shoes, weights in ordinary indoor clothing.

² Only 10 to 19 men of this height and age range.

³ Average omitted because less than 10 men of this height and age range.

TABLE 51.—WOMEN, USDA SURVEY (ALL U.S.): *Average weights for height and age, Household Food Consumption Survey, 1955*

Age in years	Weight for height of— ¹								
	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
20-24-----	115	111	119	124	125	131	134	136	136
25-29-----	116	113	129	124	125	133	139	145	146
30-34-----	120	127	127	133	131	138	140	144	139
35-39-----	132	126	132	133	137	140	142	148	149
40-44-----	128	126	134	141	145	140	148	154	156
45-49-----	135	134	138	142	141	151	148	155	164
50-54-----	139	145	143	151	146	151	151	165	² 168
55-59-----	130	² 142	139	143	145	152	153	167	² 166
60-64-----	² 137	² 140	140	142	149	151	158	² 168	² 153
65-69-----	133	² 138	144	148	146	149	152	² 162	² 150
70 +-----	124	131	134	137	137	141	149	147	² 148

¹ Height without shoes, weights in ordinary indoor clothing.

² Only 10 to 19 women of this height and age range.

and over had increased another 10 to 12 pounds, although there were relatively few women in these older age groups. Using the 65-inch women in table 53 to illustrate the distribution of weights at various ages, we find that 33, 34, and 30 percent of women 17, 20-24, and 30-39 years of age weighted less than 120 pounds, but only about 10 percent of those 40 years and over were this light in weight. The percentages of women who weighed over 150 pounds were also similar for the three age groups (9, 8, and 10 percent, respectively), but it increased to nearly 32

percent for those 40 years and over. Distributions of similar nature are found at other heights.

Tables 54 and 55 summarize weight distributions for men and women of the 1955 USDA Survey. Table 54 shows that of the 70-inch men in the age group 20-24 years, 28 percent weighed under 150 pounds compared with 35 percent of the college men, and only 9 percent weighed 180 pounds and over compared with 13 percent of the college men. In general, the percentage of heavy men increased with each 5-year period up to 50-54 or 55-59 years

TABLE 52.—MEN, ACHA STUDY: *Distribution by weights for height and age, 1948-50*

[Numbers in parentheses are number of men for the height and age group directly above.]

Height in inches	Weight	Distribution by age						
		17 years	18 years	19 years	20-24 years	25-29 years	30-39 years	40+ years
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent
65	<120	16.7	14.9	16.6	11.4	11.4	9.9	6.9
	120-129	27.2	26.4	23.0	21.7	21.3	15.3	10.3
	130-139	28.4	25.8	26.0	24.0	24.0	21.4	27.6
	140-149	14.8	17.9	17.7	20.4	18.7	21.4	13.8
	150-159	6.2	8.5	10.6	11.2	12.9	14.5	10.3
	160-169	3.1	4.2	3.4	5.5	7.3	10.7	6.9
	170+	3.7	2.2	2.7	5.7	4.4	6.9	24.0
		(162)	(496)	(265)	(807)	(342)	(131)	(29)
66	<120	11.8	9.1	6.9	7.1	8.1	7.2	1.8
	120-129	21.2	19.7	18.8	17.2	16.4	12.1	1.8
	130-139	29.7	28.6	28.0	24.1	19.9	16.3	21.1
	140-149	16.4	19.8	21.5	22.2	18.6	19.3	21.1
	150-159	10.5	10.2	14.3	14.5	17.7	18.5	14.0
	160-169	5.5	6.6	6.0	7.8	10.6	11.3	21.1
	170+	5.0	6.0	4.5	7.2	8.7	15.4	19.3
		(603)	(1,837)	(968)	(2,692)	(1,009)	(363)	(57)
67	<120	7.0	5.9	5.6	3.6	4.8	2.7	-----
	120-129	19.5	16.5	13.5	12.4	11.6	7.1	2.1
	130-139	27.9	23.8	26.6	21.8	17.3	18.1	8.5
	140-149	20.9	23.5	22.9	22.8	21.0	23.7	23.4
	150-159	13.2	15.1	18.1	17.3	18.2	22.0	19.1
	160-169	5.4	9.0	8.5	11.5	13.0	11.3	21.3
	170+	6.2	6.1	4.8	10.5	13.9	15.2	25.5
		(560)	(1,661)	(846)	(2,463)	(889)	(337)	(47)
68	<130	16.3	14.0	11.8	10.0	10.7	7.5	4.5
	130-139	23.7	22.3	20.8	18.3	15.7	15.3	13.5
	140-149	25.6	25.3	26.0	24.1	21.0	16.1	11.2
	150-159	17.6	18.6	20.4	21.0	18.3	18.7	19.1
	160-169	8.6	9.9	11.2	13.0	14.2	17.0	21.3
	170-179	4.4	4.8	5.2	6.8	9.0	10.9	10.1
	180+	3.8	5.1	4.6	6.8	11.2	14.5	20.2
		(1,331)	(4,360)	(2,183)	(6,011)	(2,125)	(713)	(89)
69	<130	12.1	9.6	7.1	6.3	6.1	5.5	7.2
	130-139	18.8	18.5	17.0	15.6	13.1	8.6	10.1
	140-149	26.0	24.2	24.5	22.5	18.4	14.4	10.1
	150-159	18.4	22.0	20.8	22.0	22.8	17.8	24.6
	160-169	11.5	12.8	15.0	15.9	16.8	17.6	14.5
	170-179	4.8	6.6	7.4	8.8	10.1	17.6	17.4
	180+	8.3	6.3	8.2	9.0	12.7	18.7	15.9
		(895)	(2,815)	(1,391)	(3,902)	(1,420)	(478)	(69)
70	<140	23.0	20.6	18.4	15.3	12.7	12.7	7.3
	140-149	23.6	23.5	22.5	19.7	16.8	14.3	9.4
	150-159	22.5	22.7	21.4	23.3	20.7	21.0	17.7
	160-169	13.5	15.3	17.3	17.3	18.0	17.1	19.8
	170-179	8.4	8.8	10.2	11.7	12.7	14.4	14.6
	180-189	4.9	4.2	4.7	6.3	9.3	7.5	9.4
	190+	4.1	4.8	5.5	6.4	9.8	13.1	21.8
		(1,570)	(5,296)	(2,660)	(6,877)	(2,273)	(743)	(96)
71	<140	15.3	14.7	10.6	10.2	9.7	8.4	4.3
	140-149	18.6	19.9	18.3	16.1	15.7	11.8	6.4
	150-159	25.2	22.3	23.7	22.1	18.5	20.2	17.0
	160-169	18.7	17.1	18.7	19.5	17.3	15.9	14.9
	170-179	10.5	12.3	14.1	14.5	15.9	15.0	14.9
	180-189	5.0	6.3	7.3	8.8	9.5	10.0	8.5
	190+	6.8	7.4	7.3	8.8	13.3	18.7	34.0
		(803)	(2,443)	(1,274)	(3,381)	(1,113)	(321)	(47)

TABLE 52.—MEN, ACHA STUDY: *Distribution by weights for height and age, 1948-50—Con.*

[Numbers in parentheses are number of men for the height and age group directly above.]

Height in inches	Weight	Distribution by age						
		17 years	18 years	19 years	20-24 years	25-29 years	30-39 years	40+ years
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent
72	<140-----	12.6	9.5	8.3	6.8	6.1	6.0	9.8
	140-149-----	17.1	17.3	16.6	14.1	11.7	8.6	7.3
	150-159-----	23.4	23.6	23.2	20.9	16.9	15.3	12.2
	160-169-----	18.5	20.6	19.9	20.0	19.2	16.9	9.8
	170-179-----	13.2	13.1	13.2	16.7	14.8	16.7	19.5
	180-189-----	6.6	7.5	9.7	10.4	14.2	13.9	12.2
	190+-----	8.6	8.5	9.1	11.1	17.1	22.5	29.3
		(1,026)	(3,523)	(1,730)	(4,446)	(1,483)	(431)	(41)
73	<150-----	22.0	18.7	17.1	14.6	13.9	8.3	5.6
	150-159-----	20.2	23.1	18.5	19.1	17.6	15.4	5.6
	160-169-----	19.9	19.6	21.6	19.2	18.0	18.3	11.1
	170-179-----	16.9	16.4	18.8	17.9	17.3	15.4	11.1
	180-189-----	10.4	9.9	12.0	12.6	11.4	11.8	27.8
	190-199-----	6.2	6.3	5.7	6.8	9.2	13.6	5.6
	200+-----	4.5	6.0	6.4	9.9	12.7	17.2	33.3
		(356)	(1,218)	(661)	(1,545)	(490)	(169)	(18)
74	<150-----	15.6	16.4	11.6	9.0	8.1	12.9	-----
	150-159-----	16.8	19.5	18.8	16.9	11.1	12.1	-----
	160-169-----	25.7	19.1	22.1	19.0	18.6	11.4	15.4
	170-179-----	17.5	16.2	18.4	17.6	19.0	12.9	15.4
	180-189-----	9.6	12.7	12.4	16.4	14.1	16.7	7.7
	190-199-----	5.8	6.7	9.5	8.7	9.8	13.6	23.1
	200+-----	8.9	9.5	7.3	12.4	19.4	20.5	38.5
		(416)	(1,306)	(643)	(1,587)	(469)	(132)	(13)
75	<150-----	8.0	9.1	5.3	5.6	4.1	6.5	-----
	150-159-----	20.0	15.9	13.2	12.3	11.8	6.5	-----
	160-169-----	14.0	18.8	25.0	19.7	16.8	6.5	-----
	170-179-----	25.0	19.1	20.4	19.9	20.2	12.9	-----
	180-189-----	16.0	13.4	17.1	17.1	17.6	16.1	100.0
	190-199-----	8.0	9.1	7.9	10.0	8.4	19.4	-----
	200+-----	9.0	14.7	11.2	15.4	21.0	32.3	-----
		(100)	(320)	(152)	(422)	(119)	(31)	(1)

TABLE 53.—WOMEN, ACHA STUDY: *Distribution by weights for height and age, 1948-50*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by age						
		17 years	18 years	19 years	20-24 years	25-29 years	30-39 years	40+ years
	<i>Pounds</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
60	<100	17.8	19.4	18.7	23.5	11.6	25.3	8.6
	100-109	34.9	33.3	31.7	29.6	31.4	26.5	8.6
	110-119	27.5	28.4	27.6	26.4	22.1	22.9	22.9
	120-129	13.8	11.4	13.4	11.7	16.3	10.8	34.3
	130-139	3.4	4.3	4.1	6.1	8.1	7.2	11.4
	140-149	1.7	1.5	1.2	1.5	5.8	4.8	11.4
	150+	1.0	1.7	3.2	1.1	4.8	2.4	2.9
		(298)	(649)	(246)	(409)	(86)	(83)	(35)
61	<100	11.8	12.8	12.3	12.5	15.2	8.7	5.3
	100-109	26.9	26.3	29.0	29.6	22.8	27.5	10.5
	110-119	30.3	30.9	28.7	30.2	26.6	22.5	15.8
	120-129	19.9	16.6	19.1	16.2	11.4	22.5	26.3
	130-139	7.0	7.9	6.2	7.3	10.1	10.0	18.4
	140-149	3.1	3.1	2.6	2.3	8.9	3.8	5.3
	150+	1.1	2.5	2.1	1.8	5.0	5.0	18.4
		(357)	(838)	(341)	(480)	(79)	(80)	(38)
62	<100	7.8	8.2	7.9	8.5	9.6	9.0	3.3
	100-109	23.5	25.3	25.5	22.8	20.0	15.4	10.6
	110-119	30.3	30.9	31.6	32.8	31.7	27.7	22.8
	120-129	21.4	20.2	19.4	22.0	18.3	22.9	17.9
	130-139	9.3	9.3	9.4	8.0	11.2	11.7	17.1
	140-149	5.0	3.6	3.6	3.3	3.3	9.6	16.3
	150+	2.7	2.5	2.6	2.5	5.8	3.7	13.0
		(964)	(2,490)	(1,096)	(1,433)	(240)	(188)	(123)
63	<100	3.6	4.3	4.3	3.9	5.0	1.9	0
	100-109	17.7	20.9	18.3	18.6	14.4	13.0	3.1
	110-119	29.8	32.9	30.0	34.8	29.3	32.5	12.5
	120-129	23.7	22.5	26.9	22.6	22.7	21.4	26.0
	130-139	15.6	10.7	11.4	11.3	13.8	16.2	27.1
	140-149	4.6	4.8	5.4	5.4	6.6	8.4	16.7
	150+	5.0	3.8	3.6	3.5	8.4	6.5	14.6
		(784)	(1,965)	(863)	(1,137)	(181)	(154)	(96)
64	<100	2.4	2.1	2.3	2.2	3.8	2.4	1.6
	100-109	11.7	13.3	14.4	13.0	11.2	9.3	4.8
	110-119	28.1	29.4	29.4	27.8	24.3	22.8	9.6
	120-129	26.3	27.8	27.0	27.8	31.4	23.5	22.4
	130-139	17.0	15.5	15.0	16.1	16.1	18.0	24.0
	140-149	8.1	6.9	6.6	6.8	5.5	9.7	15.2
	150+	6.2	5.1	5.4	6.1	7.6	14.3	22.4
		(1,694)	(4,274)	(1,936)	(2,356)	(366)	(289)	(125)
65	<110	9.8	9.5	10.8	9.4	10.8	8.6	2.6
	110-119	23.3	24.0	24.2	24.6	20.0	21.4	7.9
	120-129	31.4	29.7	30.0	29.3	33.5	28.6	25.0
	130-139	17.0	20.6	20.7	19.4	14.1	18.6	17.1
	140-149	9.6	8.8	8.6	9.8	11.4	12.9	15.8
	150-159	5.5	4.4	3.4	3.9	3.8	2.9	13.2
	160+	3.4	3.0	2.4	3.7	6.5	7.1	18.4
		(952)	(2,353)	(1,039)	(1,372)	(185)	(140)	(76)
66	<110	4.7	5.8	6.7	5.7	6.6	2.0	2.2
	110-119	17.6	18.5	18.1	17.2	15.3	9.1	3.3
	120-129	32.1	30.0	29.8	29.7	25.3	26.4	18.5
	130-139	22.3	23.4	24.9	24.0	20.6	26.9	25.0
	140-149	11.9	12.5	10.7	12.4	14.0	18.3	15.2
	150-159	6.3	5.2	5.3	6.4	9.6	5.1	15.2
	160+	5.1	4.6	4.5	4.7	8.7	12.2	20.7
		(1,299)	(3,463)	(1,521)	(2,121)	(301)	(197)	(92)

TABLE 53.—WOMEN, ACHA STUDY: *Distribution by weights for height and age, 1948-50—Con.*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by age						
		17 years	18 years	19 years	20-24 years	25-29 years	30-39 years	40+ years
	<i>Pounds</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
67	<120-----	17.2	16.3	14.6	15.9	12.8	10.9	-----
	120-129-----	26.7	27.8	29.0	25.6	25.8	20.7	5.9
	130-139-----	26.3	26.4	28.2	28.7	22.7	26.8	11.8
	140-149-----	16.7	16.3	16.1	17.3	18.2	14.6	26.5
	150-159-----	6.9	7.3	5.1	7.2	9.8	8.5	32.4
	160-169-----	2.2	3.1	3.2	2.6	4.5	9.8	8.8
	170+-----	3.9	2.9	3.7	2.8	6.1	8.6	14.7
		(539)	(1,377)	(589)	(844)	(132)	(82)	(34)
68	<120-----	10.9	10.7	10.8	10.6	11.5	7.9	11.5
	120-129-----	19.1	23.7	21.8	23.0	26.2	11.8	22.9
	130-139-----	28.5	27.9	27.4	29.7	25.4	25.0	20.0
	140-149-----	22.0	20.6	22.6	18.6	14.6	27.6	17.1
	150-159-----	9.3	9.5	9.6	8.6	12.3	14.5	8.6
	160-169-----	5.4	3.6	4.4	6.0	4.1	7.9	8.6
	170+-----	4.8	4.0	3.4	3.5	5.7	5.2	11.4
		(540)	(1,427)	(574)	(919)	(122)	(76)	(35)
69	<120-----	7.6	7.0	7.4	6.4	9.7	4.3	-----
	120-129-----	19.1	19.4	14.9	18.4	12.9	13.0	10.0
	130-139-----	22.3	27.4	30.3	21.1	16.1	21.7	-----
	140-149-----	18.5	21.5	21.3	24.8	25.8	34.8	30.0
	150-159-----	17.8	11.6	12.2	13.2	19.4	13.0	20.0
	160-169-----	9.6	7.3	5.9	7.5	3.2	4.3	10.0
	170+-----	5.1	5.9	8.0	8.6	12.9	8.7	30.0
		(157)	(372)	(188)	(266)	(31)	(23)	(10)
70	<130-----	17.4	19.0	21.1	18.9	15.1	6.2	-----
	130-139-----	27.0	18.2	24.2	20.9	33.3	12.5	12.5
	140-149-----	20.0	28.1	22.7	25.2	18.2	12.5	37.5
	150-159-----	12.2	16.8	18.8	15.0	3.0	25.0	12.5
	160-169-----	10.4	9.9	3.9	8.3	18.2	12.5	25.0
	170-179-----	7.0	2.9	6.2	7.3	9.1	6.2	12.5
	180+-----	6.1	5.1	3.2	4.3	3.0	25.0	-----
		(115)	(274)	(128)	(206)	(33)	(16)	(8)

TABLE 54.—MEN, USDA SURVEY: *Distribution by weights for height and age, Household Food Consumption Survey, 1955*

[Numbers in parentheses are number of men for the height and age group directly above.]

Height in inches	Weight	Distribution by age										
		20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70+ years
	<i>Pounds</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
65-----	<130-----			12.5	9.5	7.7	4.3	4.8	22.2	5.6	23.5	26.1
	130-139-----	20.0	37.5	18.8	9.5	7.7	8.7	4.8	3.7	11.1	11.8	13.0
	140-149-----	20.0	12.5	12.5	33.3	11.5	17.4	19.0	7.4	22.2	29.4	26.1
	150-159-----	20.0		25.0	14.3	7.7	26.1	19.0	18.5	22.2		4.3
	160-169-----	30.0	25.0	18.8	23.8	30.8	13.0	14.3	29.6	11.1	23.5	13.0
	170-179-----	10.0	12.5	6.2		19.2	21.7	19.0	3.7	16.7	11.8	
	180+-----		12.5	6.2	9.5	15.4	8.7	19.0	14.8	11.1		17.4
		(10)	(8)	(16)	(21)	(26)	(23)	(21)	(27)	(18)	(17)	(23)
66-----	<130-----	7.7		6.1	6.2		5.6	4.2	3.0	3.3	9.4	15.7
	130-139-----	34.6	11.4	15.2	8.3	7.5	11.1	4.2		13.3	6.2	19.6
	140-149-----	23.1	22.9	18.2	25.0	15.0	27.8	22.9	21.2	23.3	25.0	19.6
	150-159-----	11.5	31.4	33.3	20.8	35.0	30.6	12.5	30.3	13.3	18.8	15.7
	160-169-----	7.7	17.1	21.2	14.6	12.5	11.1	25.0	18.2	16.7	25.0	9.8
	170-179-----	11.5	8.6		10.4	10.0		6.2	12.1	13.3	3.1	7.8
	180+-----	3.8	8.6	6.1	14.6	20.0	13.9	25.0	15.2	16.7	12.5	11.8
		(26)	(35)	(33)	(48)	(40)	(36)	(48)	(33)	(30)	(32)	(51)
67-----	<130-----		3.7	2.4	2.6	2.2		6.2	2.4	9.4		7.0
	130-139-----	17.2	11.1	7.3	5.3	2.2		9.4	12.2		3.3	14.0
	140-149-----	27.6	22.2	9.8	21.1	22.2	18.4	9.4	7.3	9.4	13.3	16.3
	150-159-----	27.6	25.9	24.4	15.8	13.3	15.8	15.6	19.5	25.0	33.3	20.9
	160-169-----	20.7	18.5	31.7	23.7	31.1	28.9	25.0	22.0	28.1	16.7	18.6
	170-179-----	3.4	11.1	14.6	5.3	13.3	13.2	21.9	14.6	9.4	13.3	14.0
	180+-----	3.4	7.4	9.8	26.3	15.6	23.7	12.5	22.0	18.8	20.0	9.3
		(29)	(27)	(41)	(38)	(45)	(38)	(32)	(41)	(32)	(30)	(43)
68-----	<140-----	10.9	3.6	4.6	7.4	10.8	6.4	3.4		7.3	10.0	13.0
	140-149-----	30.4	24.6	18.5	12.3	15.4	11.5	10.2	13.0	14.6	10.0	19.6
	150-159-----	17.4	14.0	15.4	12.3	15.4	19.2	11.9	19.6	17.1	15.0	21.7
	160-169-----	17.4	29.8	21.5	24.7	13.8	15.4	27.1	28.3	26.8	22.5	15.2
	170-179-----	17.4	10.5	15.4	19.8	21.5	17.9	20.3	21.7	14.6	22.5	21.7
	180-189-----	6.5	7.0	15.4	14.8	9.2	15.4	16.9	8.7	12.2	10.0	4.3
	190+-----		10.5	9.2	8.6	13.8	14.1	10.2	8.7	7.3	10.0	4.3
		(46)	(57)	(65)	(81)	(65)	(78)	(59)	(46)	(41)	(40)	(46)
69-----	<140-----	10.5	7.1	11.1	5.2	4.2		3.7	3.1	4.5	24.0	7.1
	140-149-----	21.1	14.3	11.1	12.1	20.8	13.6	3.7	12.5	22.7	12.0	28.6
	150-159-----	28.9	19.0	11.1	19.0	25.0	13.6	11.1	6.2	9.1	12.0	10.7
	160-169-----	26.3	28.6	25.9	19.0	12.5	22.7	14.8	31.2	27.3	24.0	21.4
	170-179-----	5.3	11.9	11.1	19.0	14.6	22.7	14.8	15.6	27.3	8.0	14.3
	180-189-----	5.3	11.9	14.8	10.3	12.5	13.6	29.6	12.5		16.0	17.9
	190+-----	2.6	7.1	14.8	15.5	10.4	13.6	22.2	18.8	9.1	4.0	
		(38)	(42)	(54)	(58)	(48)	(44)	(27)	(32)	(22)	(25)	(28)
70-----	<140-----	8.5	4.3	1.4	3.7	2.9	2.6	4.3	4.3	3.3	11.5	24.4
	140-149-----	19.1	14.3	12.3	7.4	7.1	7.9	17.4	8.5	6.7	15.4	9.8
	150-159-----	25.5	17.1	13.7	11.1	7.1	18.4	17.4	12.8	10.0	11.5	17.1
	160-169-----	21.3	24.3	17.8	18.5	34.3	23.7	13.0	21.3	26.7	7.7	14.6
	170-179-----	17.0	12.9	19.2	18.5	20.0	14.5	15.2	12.8	20.0	34.6	9.8
	180-189-----	4.3	12.9	21.9	23.5	15.7	15.8	19.6	21.3	13.3	11.5	4.9
	190+-----	4.3	14.3	13.7	17.3	12.9	17.1	13.0	19.1	20.0	7.7	19.5
		(47)	(70)	(73)	(81)	(70)	(76)	(46)	(47)	(30)	(26)	(41)
71-----	<150-----	16.7	18.5	9.8	8.8	1.5	6.9	10.9	10.8	4.8	10.5	5.0
	150-159-----	22.2	5.6	8.2	6.2	6.2	5.2	4.3	5.4	9.5	21.1	20.0
	160-169-----	19.4	31.5	18.0	25.0	26.2	19.0	21.7	16.2	19.0	10.5	5.0
	170-179-----	22.2	20.4	23.0	10.0	16.9	17.2	17.4	29.7	19.0	15.8	30.0
	180-189-----	16.7	11.1	18.0	20.0	21.5	17.2	30.4	10.8	23.8	21.1	15.0
	190-199-----	2.8	9.3	9.8	15.0	12.3	17.2	6.5	5.4	14.3	10.5	10.0
	200+-----		3.7	13.1	15.0	15.4	17.2	8.7	21.6	9.5	10.5	15.0
		(36)	(54)	(61)	(80)	(65)	(58)	(46)	(37)	(21)	(19)	(20)

TABLE 54.—MEN, USDA SURVEY: *Distribution by weights for height and age, Household Food Consumption Survey, 1955—Con.*

[Numbers in parentheses are number of men for the height and age group directly above.]

Height in inches	Weight	Distribution by age										
		20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70+ years
	<i>Pounds</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
72	<150	13.3	8.1	4.9	7.7	1.3	1.9	11.4	11.5	6.9	23.8	28.2
	150-159	16.7	11.3	11.5	6.4	3.8	5.8	4.5	11.5	10.3	4.8	10.3
	160-169	23.3	17.7	13.1	11.5	15.2	17.3	9.1	15.4	17.2	23.8	20.5
	170-179	15.0	19.4	21.3	19.2	27.8	13.5	13.6	23.1	13.8	14.3	15.4
	180-189	13.3	22.6	26.2	24.4	13.9	19.2	15.9	19.2	13.8	9.5	7.7
	190-199	5.0	11.3	6.6	11.5	13.9	19.2	25.0		17.2	4.8	12.8
	200+	13.3	9.7	16.4	19.2	24.1	23.1	20.5	19.2	20.7	19.0	5.1
		(60)	(62)	(61)	(78)	(79)	(52)	(44)	(26)	(29)	(21)	(39)
73	<150	12.0	4.5	5.4		8.3			6.7	16.7	10.0	30.0
	150-159	8.0	4.5		2.6	12.5	14.3	13.3			10.0	10.0
	160-169	20.0	27.3	5.4	10.3	12.5					30.0	
	170-179	16.0	9.1	32.4	15.4	8.3	21.4	13.3	20.0	16.7		10.0
	180-189	16.0	9.1	29.7	30.8	8.3	28.6	26.7	26.7	50.0	10.0	10.0
	190-199	20.0	18.2	13.5	7.7	20.8	21.4	13.3	13.3		10.0	
	200+	8.0	27.3	13.5	33.3	29.2	14.3	33.3	33.3	16.7	30.0	40.0
		(25)	(22)	(37)	(39)	(24)	(14)	(15)	(15)	(6)	(10)	(10)
74	<150	20.0		4.0	4.2				16.7			28.6
	150-159	6.7	3.4	4.0	4.2		7.7		16.7			
	160-169	13.3	6.9	12.0	8.3	15.4	7.7	15.4		14.3		14.3
	170-179	6.7	31.0	24.0	4.2	23.1	7.7	23.1		14.3		
	180-189	26.7	24.1	8.0	12.5	15.4	7.7	7.7	16.7	28.6	66.7	28.6
	190-199	13.3	13.8	20.0	16.7	15.4	38.5	23.1		14.3	33.3	
	200+	13.3	20.7	28.0	50.0	30.8	30.8	30.8	50.0	28.6		28.6
		(15)	(29)	(25)	(24)	(13)	(13)	(13)	(6)	(7)	(3)	(7)

TABLE 55.—WOMEN, USDA SURVEY: *Distribution by weights for height and age, Household Food Consumption Survey, 1955*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by age										
		20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70+ years
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
60-----	<100-----	15.8	8.7	12.2	6.2	-----	-----	-----	-----	-----	4.8	10.0
	100-109-----	15.8	30.4	36.6	9.4	20.0	15.4	19.4	23.8	6.7	4.8	15.0
	110-119-----	42.1	21.7	9.8	12.5	16.0	11.5	6.5	9.5	13.3	9.5	27.5
	120-129-----	10.5	17.4	19.5	12.5	24.0	15.4	12.9	14.3	6.7	23.8	10.0
	130-139-----	10.5	17.4	9.8	25.0	20.0	19.2	12.9	19.0	13.3	19.0	12.5
	140-149-----	5.3	-----	-----	12.5	4.0	15.4	6.5	9.5	40.0	19.0	5.0
	150+-----	-----	4.3	12.2	21.9	16.0	23.1	41.9	23.8	20.0	19.0	20.0
		(19)	(23)	(41)	(32)	(25)	(26)	(31)	(21)	(15)	(21)	(40)
61-----	<100-----	17.4	20.0	12.8	-----	8.6	-----	-----	5.9	-----	-----	6.5
	100-109-----	30.4	30.0	15.4	20.6	14.3	14.3	-----	-----	-----	-----	9.7
	110-119-----	30.4	15.0	17.9	23.5	17.1	19.0	8.7	11.8	18.2	20.0	9.7
	120-129-----	8.7	10.0	12.8	23.5	11.4	14.3	17.4	11.8	18.2	20.0	12.9
	130-139-----	8.7	20.0	10.3	11.8	22.9	19.0	8.7	35.3	45.5	-----	25.8
	140-149-----	-----	-----	12.8	5.9	5.7	14.3	21.7	11.8	-----	10.0	16.1
	150+-----	4.3	5.0	17.9	14.7	20.0	19.0	43.5	23.5	18.2	50.0	19.4
		(23)	(20)	(39)	(34)	(35)	(21)	(23)	(17)	(11)	(10)	(31)
62-----	<110-----	29.4	14.5	19.0	12.0	11.0	11.9	3.0	9.7	5.8	10.0	16.4
	110-119-----	19.6	20.3	29.1	16.3	13.4	11.9	12.1	19.4	15.4	7.5	13.1
	120-129-----	29.4	23.2	16.5	19.6	25.6	23.9	16.7	12.9	13.5	17.5	13.1
	130-139-----	13.7	20.3	20.3	22.8	17.1	17.9	16.7	17.7	21.2	10.0	19.7
	140-149-----	5.9	5.8	6.3	9.8	12.2	6.0	12.1	12.9	11.5	10.0	11.5
	150-159-----	2.0	4.3	3.8	4.3	6.1	6.0	12.1	4.8	9.6	10.0	9.8
	160+-----	-----	11.6	5.1	15.2	14.6	22.4	27.3	22.6	23.1	35.0	16.4
		(51)	(69)	(79)	(92)	(82)	(67)	(66)	(62)	(52)	(40)	(61)
63-----	<110-----	10.6	13.0	8.2	7.3	4.9	3.4	1.8	2.6	5.3	2.4	18.2
	110-119-----	36.2	27.8	15.1	13.4	8.5	13.6	12.3	10.3	7.9	7.3	6.8
	120-129-----	27.7	35.2	23.3	22.0	18.3	18.6	10.5	15.4	15.8	4.9	13.6
	130-139-----	14.9	11.1	24.7	24.4	26.8	16.9	14.0	20.5	15.8	22.0	15.9
	140-149-----	2.1	7.4	6.8	17.1	12.2	13.6	12.3	12.8	10.5	14.6	9.1
	150-159-----	6.4	1.8	8.2	6.1	11.0	13.6	14.0	7.7	15.8	14.6	9.1
	160+-----	2.1	3.7	13.7	9.8	18.3	20.3	35.1	30.8	28.9	34.1	27.3
		(47)	(54)	(73)	(82)	(82)	(59)	(57)	(39)	(38)	(41)	(44)
64-----	<110-----	8.5	15.2	4.0	8.2	3.5	3.0	1.3	6.6	-----	4.5	9.8
	110-119-----	24.4	24.2	21.2	9.1	8.7	13.9	3.8	6.6	7.0	4.5	9.8
	120-129-----	31.7	26.3	27.3	20.0	16.5	16.8	11.5	14.8	8.8	4.5	16.4
	130-139-----	19.5	16.2	20.2	27.3	23.5	19.8	20.5	18.0	17.5	20.5	9.8
	140-149-----	8.5	10.1	15.2	10.9	13.9	14.9	21.8	11.5	15.8	27.3	18.0
	150-159-----	3.7	4.0	4.0	9.1	6.1	9.9	15.4	11.5	22.8	11.4	18.0
	160+-----	3.7	4.0	8.1	15.5	27.8	21.8	25.6	31.1	28.1	27.3	18.0
		(82)	(99)	(99)	(110)	(115)	(101)	(78)	(61)	(57)	(44)	(61)
65-----	<120-----	17.4	21.0	11.4	13.6	16.7	6.2	7.5	6.8	7.4	3.9	12.5
	120-129-----	34.8	21.0	19.0	13.6	12.1	15.4	6.0	9.1	7.4	7.8	12.5
	130-139-----	26.1	21.0	29.1	27.3	24.2	16.9	17.9	18.2	14.8	19.6	17.5
	140-149-----	8.7	17.7	19.0	18.2	21.2	18.5	20.9	9.1	20.4	13.7	20.0
	150-159-----	6.5	9.7	7.6	17.0	10.6	12.3	14.9	18.2	22.2	17.6	17.5
	160-169-----	6.5	3.2	8.9	3.4	6.1	7.7	10.4	11.4	11.1	23.5	10.0
	170+-----	-----	6.4	5.1	6.8	9.1	23.1	22.4	27.3	16.7	13.7	10.0
		(46)	(62)	(79)	(88)	(66)	(65)	(67)	(44)	(54)	(51)	(40)
66-----	<120-----	20.8	14.7	8.7	8.9	7.3	1.3	1.7	-----	5.4	8.3	12.5
	120-129-----	19.4	20.0	18.8	21.1	12.2	16.5	10.3	4.5	8.1	5.6	5.0
	130-139-----	31.9	20.0	34.8	22.2	23.2	20.3	22.4	20.5	13.5	11.1	12.5
	140-149-----	11.1	21.3	14.5	17.8	14.6	22.8	22.4	22.7	8.1	19.4	5.0
	150-159-----	5.6	6.7	8.7	7.8	13.4	12.7	13.8	18.2	16.2	22.2	15.0
	160-169-----	5.6	6.7	2.9	8.9	12.2	11.4	10.3	13.6	16.2	11.1	35.0
	170+-----	5.6	10.7	11.6	13.3	17.1	15.2	19.0	20.5	32.4	22.2	15.0
		(72)	(75)	(69)	(90)	(82)	(79)	(58)	(44)	(37)	(36)	(40)

TABLE 55.—WOMEN, USDA SURVEY: *Distribution by weights for height and age, Household Food Consumption Survey, 1955—Con.*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by age										
		20-24 years	25-29 years	30-34 years	35-39 years	40-44 years	45-49 years	50-54 years	55-59 years	60-64 years	65-69 years	70+ years
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
67	<130	37.8	30.0	22.7	14.6	-----	12.9	4.3	3.8	-----	-----	18.2
	130-139	27.0	20.0	27.3	25.0	35.3	16.1	8.7	15.4	-----	17.6	27.3
	140-149	21.6	12.5	13.6	18.7	17.6	16.1	21.7	3.8	10.0	17.6	4.5
	150-159	5.4	15.0	18.2	14.6	11.8	19.4	17.4	7.7	20.0	11.8	9.1
	160-169	2.7	12.5	4.5	8.3	11.8	12.9	8.7	30.8	30.0	-----	27.3
	170-179	-----	-----	9.1	10.4	5.9	3.2	8.7	11.5	20.0	29.4	9.1
	180+	5.4 (37)	10.0 (40)	4.5 (44)	8.3 (48)	17.6 (34)	19.4 (31)	30.4 (23)	26.9 (26)	20.0 (10)	23.5 (17)	4.5 (22)
68	<130	32.0	22.7	26.1	18.5	10.3	4.0	5.6	-----	16.7	28.6	33.3
	130-139	20.0	40.9	26.1	22.2	24.1	16.0	11.1	16.7	-----	7.1	-----
	140-149	32.0	4.5	13.0	18.5	17.2	8.0	16.7	8.3	25.0	7.1	11.1
	150-159	8.0	4.5	26.1	11.1	13.8	16.0	16.7	-----	16.7	21.4	22.2
	160-169	-----	13.6	8.7	14.8	6.9	12.0	11.1	33.3	16.7	14.3	-----
	170-179	8.0	4.5	-----	3.7	13.8	12.0	11.1	8.3	8.3	7.1	11.1
	180+	-----	9.1 (25)	-----	11.1 (27)	13.8 (29)	32.0 (25)	27.8 (18)	33.3 (12)	16.7 (12)	14.3 (14)	22.2 (9)

regardless of height. After 60 years the percentage was frequently smaller in the heavier weight groups than found at younger ages.

Table 55 shows that of the 65-inch women in the age group 20-24 years in the 1955 USDA Survey, 17 percent weighed less than 120 pounds and 13 percent weighed 150 pounds or over, compared with 34 and 8 percent, respectively, of the college women. A shift toward heavier weights was found for each age group of women, with a sharp increase in the groups 45-49 and 50-54 years.

In general, the percentages of heavy women showed some variation with age at different heights, but a sharp increase was found in the proportion of heavy women among those in their 40's or early 50's continuing through the early 60's in most cases and even into the 70's for some. Actually, among men and women 65 inches and over in height and 65 to 69 years of age a higher percentage of the women weighed 170 pounds and over. For other height-age groups the average weights of women corresponded closely to the average for men in the same height-age categories.

Data were insufficient in the 1955 USDA Survey to show distributions by areas of the United States, so that the only data available for such distributions are those of the O'Brien study (table 56). There was a tendency for the women in the Atlantic region to be heavier for their height than those from the other

two regions, but not consistently so. Similar trends were also observed from average weights for heights. The women in the O'Brien study were generally heavier than women of corresponding heights and ages in the 1955 USDA Survey (table 55) in spite of the fact that the former were measured without clothing whereas the latter were clothed except for shoes. Some differences might be due to the fact that the O'Brien data were actual measurements, while those of the 1955 USDA Survey were estimates.

Suggested Weights for Heights of Young Adults

Insurance companies, on the basis of mortality studies, advocate that weights at 25-30 years of age should not be exceeded as one grows older. Data from various studies for men and women 20-29 years old have been used to construct a series of charts and tables to show changes in average weights for height that may have occurred since the early tables were prepared.

In figure 18 are presented for comparison the weight for height data for young men from the Association of Life Insurance Medical Directors (1912) and the Equitable Life Assurance Society of the United States (Smith, n.p.), both sets being corrected for probable weight of clothing and height of heels at the time of measurements as indicated in section I, page 2. Men, in general, were heavier in 1940 than in 1885 to 1900. The

TABLE 56.—WOMEN, O'BRIEN STUDY: *Distribution by weights for height, age, and area, 1939-40*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by geographic location aged—											
		20-29 years			30-39 years			40-49 years			50-59 years		
		At-lantic	Central	Pacific	At-lantic	Central	Pacific	At-lantic	Central	Pacific	At-lantic	Central	Pacific
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
60	<100	13.3	9.8	24.3	7.0	9.5	4.9	2.4	12.5	-----	2.3	4.8	-----
	100-109	32.7	31.7	24.3	18.0	9.5	22.0	11.8	12.5	4.5	9.3	-----	-----
	110-119	21.3	24.4	21.6	21.9	19.0	29.3	11.8	16.7	9.1	9.5	13.0	-----
	120-129	12.0	12.2	24.3	14.8	21.4	14.6	18.9	16.7	27.3	10.5	9.5	8.7
	130-139	10.0	7.3	-----	8.6	19.0	12.2	15.7	8.3	9.1	12.8	23.8	26.1
	140-149	3.3	7.3	5.4	5.5	7.1	4.9	11.8	12.5	13.6	7.0	19.0	21.7
	150+	7.3	7.3	-----	24.2	14.3	12.2	27.6	20.8	36.4	48.8	33.3	30.4
		(150)	(41)	(37)	(128)	(42)	(41)	(127)	(24)	(22)	(86)	(21)	(23)
61	<100	11.0	11.5	14.5	7.4	-----	3.8	2.9	5.8	2.0	4.8	8.6	2.4
	100-109	26.2	20.5	22.6	17.0	14.8	11.3	9.2	13.5	6.1	3.8	2.9	9.5
	110-119	29.3	34.6	32.3	17.0	26.2	22.6	9.2	7.7	10.2	7.6	11.4	9.5
	120-129	16.8	20.5	12.9	17.0	23.0	32.1	16.7	21.2	18.4	14.3	5.7	11.9
	130-139	6.8	7.7	16.1	13.1	16.4	11.3	17.2	15.4	20.4	14.3	11.4	21.4
	140-149	4.2	-----	1.6	8.5	1.6	11.3	10.9	13.5	14.3	11.4	11.4	11.9
	150+	5.8	5.1	-----	19.9	18.0	7.5	33.9	23.1	28.6	43.8	48.6	33.3
		(191)	(78)	(62)	(176)	(61)	(53)	(174)	(52)	(49)	(105)	(35)	(42)
62	<100	7.5	7.8	3.4	2.4	3.1	2.7	0.6	2.6	-----	1.6	5.1	-----
	100-109	18.1	20.0	19.3	12.5	13.4	13.7	2.9	15.6	8.9	2.3	-----	6.4
	110-119	27.9	35.7	26.1	20.2	20.6	15.1	12.2	13.0	16.5	7.8	10.3	6.4
	120-129	18.5	16.5	20.5	22.2	21.7	35.6	12.2	23.4	20.3	12.5	12.8	17.0
	130-139	10.6	10.4	15.9	19.0	23.7	11.0	15.7	10.4	16.5	16.4	17.9	10.6
	140-149	6.4	3.5	4.5	6.5	6.2	6.8	13.4	14.3	7.6	13.3	12.8	17.0
	150+	10.9	6.1	10.2	17.3	11.3	15.1	43.0	20.8	30.4	46.1	41.0	42.6
		(265)	(115)	(88)	(248)	(97)	(73)	(172)	(77)	(79)	(128)	(39)	(47)
63	<110	21.1	19.5	17.3	12.0	14.5	12.3	4.7	5.8	4.4	3.4	10.0	1.9
	110-119	26.6	29.7	30.9	20.5	20.5	21.9	7.8	8.1	12.1	3.4	5.0	5.6
	120-129	22.6	25.4	20.0	21.4	18.8	24.7	14.6	19.8	16.5	11.5	10.0	7.4
	130-139	13.3	15.3	16.4	13.8	15.4	15.1	18.2	20.9	19.8	6.9	25.0	16.7
	140-149	7.0	7.6	10.0	10.3	12.0	11.0	13.0	11.6	17.6	11.5	10.0	14.8
	150-159	3.9	1.7	0.9	5.4	7.7	9.6	16.7	8.1	12.1	12.6	10.0	11.1
	160+	5.5	0.8	4.5	16.5	11.1	5.5	25.0	25.6	17.6	50.6	30.0	42.6
		(256)	(118)	(110)	(224)	(117)	(73)	(192)	(86)	(91)	(87)	(40)	(54)
64	<110	11.0	10.1	10.3	12.2	5.5	7.4	4.1	3.0	1.5	1.8	6.2	2.2
	110-119	28.6	26.2	36.8	21.4	15.7	20.0	7.5	6.1	4.6	5.3	6.2	8.7
	120-129	25.5	32.9	29.9	19.1	18.5	25.3	16.3	15.2	20.0	10.5	15.6	8.7
	130-139	15.3	17.4	11.5	19.1	20.4	31.6	12.9	18.2	27.7	12.3	15.6	17.4
	140-149	8.6	8.1	3.4	8.1	13.0	5.3	12.2	16.7	13.8	14.0	25.0	8.7
	150-159	4.3	2.0	3.4	10.4	7.4	5.3	14.3	9.1	9.2	10.5	6.2	15.2
	160+	6.7	3.4	4.6	9.8	19.4	5.3	32.7	31.8	23.1	45.6	25.0	39.1
		(255)	(149)	(87)	(173)	(108)	(95)	(147)	(66)	(65)	(57)	(32)	(46)
65	<110	7.4	7.9	7.8	9.1	5.9	1.8	3.6	-----	3.6	-----	11.8	-----
	110-119	27.3	23.8	29.7	15.7	13.2	12.3	4.7	7.7	3.6	10.8	-----	-----
	120-129	32.9	26.7	29.7	21.5	26.5	19.3	14.1	15.4	5.4	10.8	11.8	3.3
	130-139	16.1	21.8	17.2	17.4	17.6	24.6	16.5	2.6	17.9	10.8	11.8	16.7
	140-149	8.1	12.9	12.5	13.2	14.7	15.8	12.9	23.1	26.8	21.6	11.8	6.7
	150-159	3.1	3.0	3.1	7.4	10.3	8.8	8.2	15.4	17.9	5.4	11.8	33.3
	160+	5.0	4.0	-----	15.7	11.8	17.5	40.0	35.9	25.0	40.5	41.2	40.0
		(161)	(101)	(64)	(121)	(68)	(57)	(85)	(39)	(56)	(37)	(17)	(30)

TABLE 56.—WOMEN O'BRIEN STUDY: *Distribution by weights for height, age, and area, 1939-40—Con.*

[Numbers in parentheses are number of women for the height and age group directly above.]

Height in inches	Weight	Distribution by geographic location aged—											
		20-29 years			30-39 years			40-49 years			50-59 years		
		At-lantic	Central	Pacific	At-lantic	Central	Pacific	At-lantic	Central	Pacific	At-lantic	Central	Pacific
	Pounds	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
66	<120	23.1	17.3	12.1	18.7	18.3	12.8	7.1	7.7	6.8	---	---	---
	120-129	25.0	28.0	31.0	17.5	24.2	17.0	8.8	15.4	10.3	8.0	7.1	---
	130-139	23.1	24.0	31.0	25.0	24.2	25.5	15.8	23.1	10.3	8.0	21.4	5.9
	140-149	12.5	16.0	12.1	21.2	12.1	14.9	22.8	26.9	17.2	16.0	28.6	5.9
	150-159	4.8	6.7	8.6	5.0	9.1	17.0	15.8	19.2	20.7	24.0	14.3	23.9
	160-169	3.8	5.3	3.4	3.8	12.1	2.1	7.0	---	10.3	20.0	7.1	35.3
	170 +	7.7	2.7	1.7	8.8	---	10.6	22.8	7.7	24.1	24.0	21.4	29.4
		(104)	(75)	(58)	(80)	(33)	(47)	(57)	(26)	(29)	(25)	(14)	(17)
67	<120	12.3	9.7	9.3	10.5	6.5	9.1	3.8	---	---	10.0	---	---
	120-129	24.6	29.0	34.4	21.1	16.1	13.6	3.8	10.0	---	10.0	11.1	---
	130-139	22.8	29.0	15.6	26.3	25.8	18.2	15.4	50.0	11.8	30.0	11.1	9.1
	140-149	19.3	19.4	25.0	15.8	25.8	40.9	19.2	---	23.5	10.0	11.1	18.2
	150-159	10.5	6.5	9.4	13.2	3.2	9.1	19.2	10.0	17.6	---	22.2	27.3
	160-169	1.8	6.5	3.1	2.6	12.9	9.1	11.5	20.0	11.8	10.0	---	9.1
	170 +	8.8	---	3.1	10.5	9.7	---	26.9	10.0	35.3	30.0	44.4	36.4
		(57)	(31)	(32)	(38)	(31)	(22)	(26)	(10)	(17)	(10)	(9)	(11)

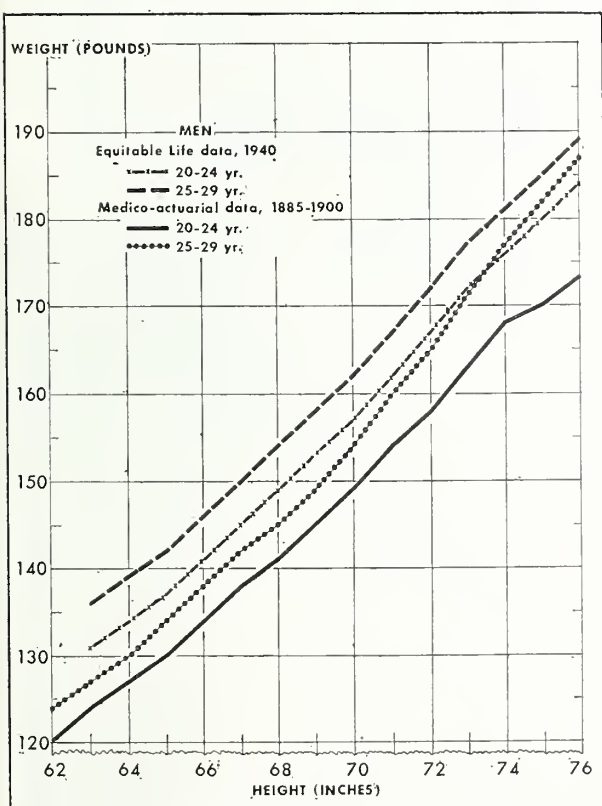


FIGURE 18.—Weights for height and age of young men from two sets of insurance data, nearly 50 years apart.

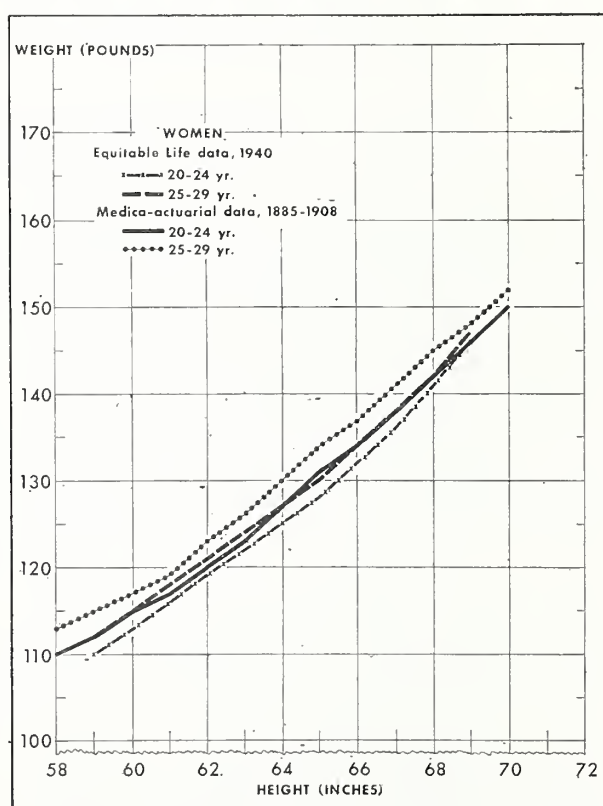


FIGURE 19.—Weights for height and age of young women from two sets of insurance data, nearly 50 years apart.

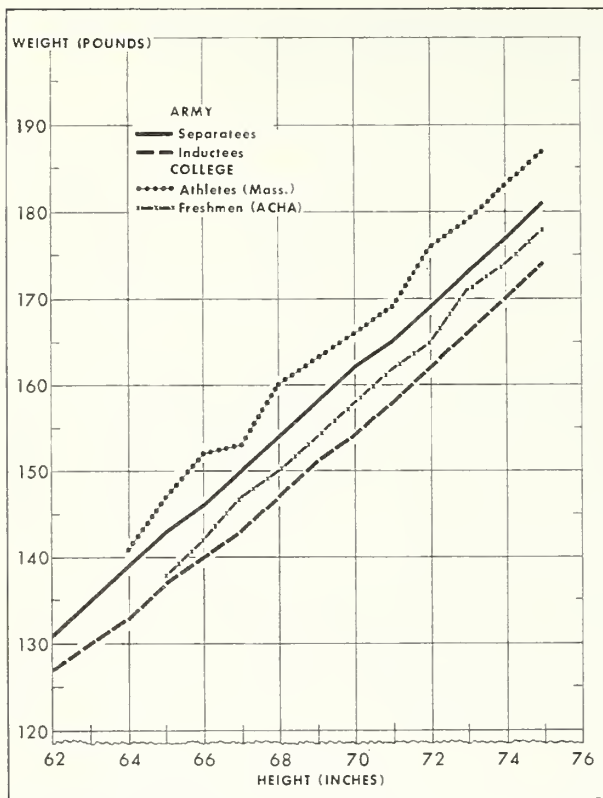


FIGURE 20.—Weights for height of four groups of men, 20–24 years old, between 1943 and 1951.

shorter men (69 inches and less) in 1940 were heavier at 25–29 years compared with those at 20–24 years than they were in 1885 to 1900. The difference between the two age groups was greater for the men 71 inches and taller in the earlier study. The men in the 1940 study would be heavier than those in the 1885–1900 study, even if the difference in the weight of clothing in the two periods were not considered.

Weights for heights of young women from the two sets of insurance data are presented in figure 19, again being corrected for weight of clothing and height of heels. Data for women for whom heights and weights were reported with clothing including shoes are more difficult to evaluate in terms of values without clothing than are corresponding data for men. There is greater variation in heights of heels on women's shoes, and of weights of clothing worn both from time period to time period and among individuals in a given time period. In contrast to the men, the women in 1940 were lighter than the corresponding groups in 1885–1908, and differences between the weights in the two periods were slight.

Without correction for clothing the differences between weights in the two studies would be slightly

greater than reported here, since clothing for women was lighter weight in 1940 than in 1900.

In figure 20 and 21, comparison is made of two groups of army men with two groups of students entering college, all measured between 1943 and 1951. For the men aged 20–24 years (figure 20) the army inductees (Karpinos 1958) and ACHA college students (American College Health Association n.p.) were lighter at all heights than the army separatees (Newman 1952) and the Springfield College (Mass.) students who were physical education majors (Condron and Karpovich n.p.). For those aged 25–29 years (fig. 21) the weights of the two college groups were about the same as for the corresponding groups aged 20–24 years, but both army groups were heavier by 5 or 6 pounds than the corresponding groups of younger army men. Data in both figures illustrate that men with intensive physical training were heavier than men of corresponding heights without such training. These men with training probably were more muscular rather than more obese than those without special training. Unfortunately other measurements such as chest breadth or bi-iliac diameter were not available.

Table 57 presents the data used in constructing

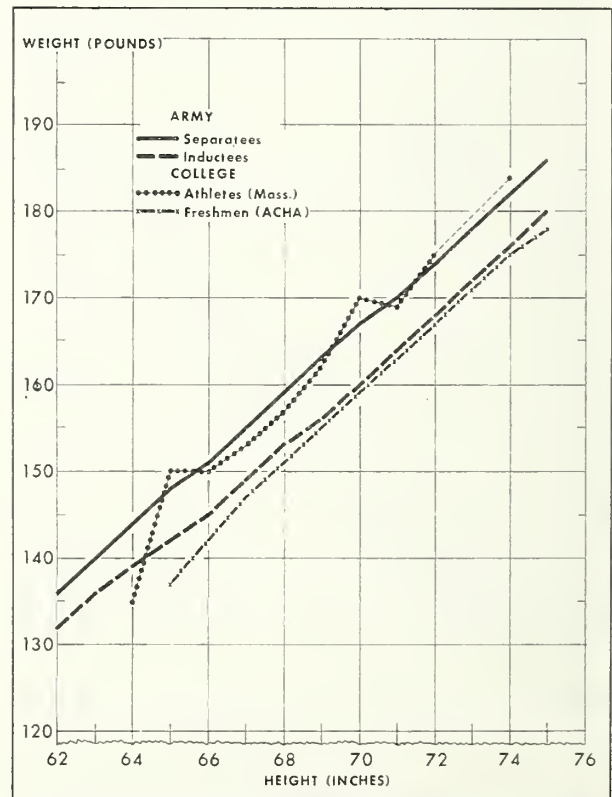


FIGURE 21.—Weights for height of four groups of men, 25–29 years old, between 1943 and 1951.

TABLE 57.—MEN AGED 20–29 YEARS: *Average weights for height and age in two insurance company studies, two army studies, and two college studies, 1885–1951*

Height in inches	Insurance data 1885–1900 ¹		Insurance data 1940 ²		Army inductees 1943–44 ³		Army separates 1946–49 ⁴		College students 1948–50 ⁵		College athletes 1946 ⁶	
	20–24 years	25–29 years	20–24 years	25–29 years	20–24 years	25–29 years	20–24 years	25–29 years	20–24 years	25–29 ⁷ years	20–24 years	25–29 years
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
59	112	117	-----	-----	118	123	-----	-----	-----	-----	-----	-----
60	114	119	-----	-----	121	126	-----	-----	-----	-----	-----	-----
61	117	121	-----	-----	124	129	-----	-----	-----	-----	-----	-----
62	120	124	-----	-----	127	132	131	136	-----	-----	-----	-----
63	124	127	131	136	130	136	135	140	-----	-----	-----	-----
64	127	130	134	139	133	139	139	144	-----	-----	141	135
65	130	134	137	142	137	142	143	148	138	137	147	150
66	134	138	141	146	140	145	146	151	142	142	152	150
67	138	142	145	150	143	149	150	155	147	147	153	153
68	141	145	149	154	147	153	154	159	150	151	160	157
69	145	149	153	158	151	156	158	163	154	155	163	162
70	149	154	157	162	154	160	162	167	158	159	166	170
71	154	160	162	167	158	164	165	170	162	163	169	169
72	158	165	167	172	162	168	169	174	165	167	176	175
73	163	171	172	177	166	172	173	178	171	171	179	189
74	168	177	176	181	170	176	177	182	174	175	183	184
75	170	182	180	185	174	180	181	186	178	178	187	202
76	173	187	184	189	178	184	-----	-----	-----	-----	-----	-----
77	-----	-----	-----	-----	183	189	-----	-----	-----	-----	-----	-----
78	-----	-----	-----	-----	187	193	-----	-----	-----	-----	-----	-----

¹ Source: Association of Life Insurance Medical Directors (1912); corrected for 1 inch heels and 7–10 pounds of clothing (see page 2).

² Source: Equitable Life Assurance Society, Smith (n.p.); corrected for 1 inch heels and 3–5 pounds of clothing (see page 3).

³ Source: Karpinos (1958); measured without clothing.

⁴ Source: Newman (1952); measured without clothing.

⁵ Source: American College Health Association (n.p.); measured without clothing.

⁶ Source: Condron and Karpovich (n.p.); measured without clothing.

⁷ Median weights.

figures 18, 20, and 21. The civilian men measured in 1940 corresponded in weight more closely to the army inductees and college students of 1948–50 than to the army separates and athletes. In both groups the 1940 civilians over 70 inches tall were heavier than the army separates. All men in the 1940's were heavier for their height than those in 1885–1900.

New tables of suggested weights for heights based on the data from the American College Health Association study (n.p.), have been prepared, using three levels of weights for each height—the 25th, 50th, and 75th percentiles. The new values for men are presented in table 58 along with those of the Metropolitan Life Insurance Co. (1943, 1958) for insured men and of White (1956) for army separates. For the Metropolitan data the middle of the average group and for White's data, the medium group have been used in this table to facilitate comparison of the weights. Data from these two studies, which have been used or proposed as standards for men, are set up in a form somewhat similar to the new

tables suggested as desirable for the 1950's. There were few men in the college group shorter than 65 inches, so that weights for men 63 and 64 inches are estimates. Our range of weights at some heights are slightly wider than those from the other two studies, but in general they agree within a few pounds. As is to be expected from the earlier discussion, the shorter army separates were heavier than men of the same height in the other two groups. For the taller men there was less difference among the three groups.

Fewer data were available for college women than for college men. This was particularly true for women aged 25–29 years, so that weight-for-height data for the 25th, 50th, and 75th percentiles for this age group gave somewhat irregular values for increments in weight per inch of height. Median values for the women aged 20–24 years gave a much smoother curve, and differences from the weights for those 25–29 years were generally only 1 or 2

TABLE 58.—MEN AGED 25-29 YEARS: *Weights for heights from three studies*

Height in inches	Insurance data ¹			Army data ²			College data ³		
	Small	Medium	Large	Small	Medium	Large	Low	Median	High
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
62-----	120	128	137	124	133	146			
63-----	123	131	139	127	136	150	⁴ (118)	(129)	(141)
64-----	127	135	143	130	140	154	(122)	(133)	(145)
65-----	131	139	147	134	144	158	126	137	149
66-----	134	142	151	137	148	161	130	142	155
67-----	138	146	155	140	151	165	134	147	161
68-----	142	151	160	144	154	169	139	151	166
69-----	146	155	164	147	158	172	143	155	170
70-----	150	159	168	150	161	176	147	159	174
71-----	154	163	173	154	164	180	150	163	178
72-----	158	167	177	157	168	183	154	167	183
73-----	163	172	182	160	172	187	158	171	188
74-----	169	177	187	164	175	191	162	175	192
75-----	174	182	193	167	179	195	165	178	195

¹ Source: Metropolitan Life Insurance Co. (1943, 1958): Heights with shoes and weights in indoor clothing, but values were considered satisfactory to be used for heights and weights without clothing. Middle of the ranges for weight have been used (*see* page 49 and table 38).

² Source: White (1956): Heights and weights without clothing, weights for small, medium, and large are average values based on chest breadth and biiliac diameter (*see* table 67).

³ Source: American College Health Association (n.p.): Heights and weights without clothing; weights for 25th, 50th, and 75th percentiles for men 25-29 years old.

⁴ Values in parentheses were extrapolated.

TABLE 59.—WOMEN AGED 20-29 YEARS: *Weights for heights from two studies*

Heights in inches	Insurance data ¹			College data ²		
	Small	Medium	Large	Low	Median	High
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
60-----	111	118	126	100	109	118
61-----	114	121	129	104	112	121
62-----	117	124	132	107	115	125
63-----	121	128	136	110	118	128
64-----	124	131	140	113	122	132
65-----	127	135	144	116	125	135
66-----	131	139	148	120	129	139
67-----	134	142	151	123	132	142
68-----	138	146	155	126	136	146
69-----	142	150	159	130	140	151
70-----	145	153	162	133	144	156
71-----	147	157	167	³ (137)	(148)	(161)

¹ Source: Metropolitan Life Insurance Company (1942): Original weights have been corrected by subtraction for clothing weights and heel heights. Middle of the range for weights have been used (*see* page 00 and table 38).

² Source: American College Health Association (n.p.): Heights and weights without clothing; weights for 25th, 50th, and 75th percentiles for women 20 to 24 years old.

³ Values in parentheses were extrapolated.

pounds. Therefore, the weights used from the ACHA data in table 59 are those for the college women 20-24 years old. The problem of correcting for heels and clothing in the Metropolitan data for women is also greater than for the men (*see* section I, page 2). With the corrections used, weights for height for the Metropolitan data are greater than those for the

ACHA Study by 6 to 11 pounds. The greatest differences are found for women light for their height.

Use of measurements without clothing for height-weight tables seems more valid than use of measurements with clothing, since heel heights and clothing weights vary from person to person and from time

period to time period. It is easier to estimate what present clothing weighs than to estimate what clothing weighed at an indefinite period in the past. Shoes can be removed easily for measurements, and weight of other clothing can be estimated and deducted for the individual at the time of measurement.

These smoothed 25th, 50th, and 75th percentiles for weights for heights of college men and women probably represent the most desirable weights for

heights of men and women in the United States in the 1950's. As indicated in table 80 on the inside of the back cover, weight at any age probably should not exceed these values by more than 5 pounds for shorter adults and 10 pounds for taller ones.

In the "Addendum," page 109, these suggested weights for heights are compared with the recently published data of the Society of Actuaries (1959), based on five million men and women.

SECTION III.—DATA ON MEN IN THE MILITARY SERVICE

Additional data are available from records for men in the military services. It is recognized that for military purposes limits are placed on minimum and maximum heights and weights, and that such limits have been redefined frequently over the years. In general, the military data represent healthy young men of the various periods.

Table 60 presents army data classified by region of nativity. Although the numbers in some groups are small, and the data are not strictly comparable as nativity or home State records were not always determined on the same basis, certain trends are apparent. Men from the Northeast—New England and Middle Atlantic States—were generally 0.3 to 0.5 inch shorter than those in other groups. Men from the West North Central and East South Central regions usually were tallest.

The army men of 1839–55 (Coolidge 1856) were taller than those of the Civil War probably because of the basis for selection. No men under 65 inches were accepted in the army prior to the Civil War. They were largely "old Americans," who had chosen the army as a career. Gould (1869) states that in the 1860's the sailors were shorter than army men, because of privations of nautical life and the greater agility of shorter men on the rolling ships of the day. The fact that the World War I soldiers were shorter than those of the Civil War may be due to the large number of young men of Southern European ancestry among the draftees of 1917–18 (*see* section V). Men in the East South Central region showed the least deviation, with less influence from the more recent immigrants. The aviators of World War II (Herzberg 1954) were a group selected partially on the basis of height, so that they generally averaged 0.6 to 0.9 inch taller than other groups from the same period and region.

In table 61 are presented data from various sources on average heights and weights of men in the different military services. Data are included for men from 18 to 50 years old and for the years from 1861 through 1955. Trends in average heights over the years show little consistency. In the 1860's the U.S. volunteers were taller than the draftees or their substitutes. Army recruits in the 1890's were about 0.5 inch taller than the draftees in the 1860's. Aviators in the 1940's were generally taller than men in other services. Some general increase in heights over the years is evident, however.

In table 62 are presented heights of a limited number of United States service men killed in the Korean War, 1950–53. These data were from induction records for men whose long bones were measured by Trotter and Gleser (1958) in a study on the estimation of stature from length of long bones after death. Most of the data are for white soldiers, but some were for Negroes, and a few for men of Mongolian, Mexican, and Puerto Rican ancestry. There was no significant difference between the stature of white and Negro men in this sample of military men.

Trends for weights for height and age of army men over the years are summarized in table 63, followed by the detailed tables of Ireland (1926), Karpinos (1958), and Newman (1952), (tables 64, 65, and 66). Draftees in World War I were lighter for their height and age than men in any other group. Civil War soldiers also weighed less for their height and age than army men in the 1940's. Gibbons and associates (1953b) studied the effect of 11 weeks of training, 8 hours of sleep, and 3,000 calories on the weight of 3,116 navy men. They found that fall and winter trainees gained more than spring and summer ones. The smaller and younger men tended to gain, the

TABLE 60.—MILITARY MEN: *Heights by region of nativity and date of study, 1839-1953*

Date of study and type of service men	New England		Middle Atlantic		East North Central		West North Central		South Atlantic	
	Cases	Height	Cases	Height	Cases	Height	Cases	Height	Cases	Height
	Number	Inches	Number	Inches	Number	Inches	Number	Inches	Number	Inches
1839-55: Army men ¹ -----	300	68.4	300	67.9	300	69.1	100	68.6	500	69.2
1860-65: Volunteer recruits ² -----	102,768	68.2	185,366	67.9	167,779	68.7	998	68.4	³ 31,642	68.6
Sailors -----	14,068	66.7	17,074	66.4	2,121	67.5	-----	-----	³ 4,589	67.0
Draft recruits -----	29,930	67.4	108,006	67.3	137,635	67.9	18,265	68.2	16,203	67.8
1917-19: Inductees -----	54,679	66.8	194,962	66.7	205,804	67.4	102,523	68.0	95,763	67.8
Separatees -----	7,733	66.9	23,261	66.9	24,147	67.6	8,996	68.2	12,337	68.1
1940-53: Army-chemical warfare -----	166	67.7	701	67.7	473	68.1	252	68.7	623	68.4
Army inductees -----	1,042	68.0	2,921	68.0	2,226	68.3	2,251	68.5	2,215	68.3
Aviators -----	207	68.7	644	68.9	741	68.9	563	69.4	449	69.1

	East South Central		West South Central		Mountain		Pacific		First author and date of publication
	Cases	Height	Cases	Height	Cases	Height	Cases	Height	
	Number	Inches	Number	Inches	Number	Inches	Number	Inches	
1839-55: Army men ¹ -----	300	69.3	-----	-----	-----	-----	-----	-----	Coolidge 1856
1860-65: Volunteer recruits ² -----	⁴ 34,928	69.1	³ 8,318	68.7	-----	-----	-----	-----	} Gould 1869 Baxter 1875
Sailors -----	-----	-----	-----	-----	-----	-----	-----	-----	
Draft recruits -----	4,252	68.7	-----	-----	-----	-----	1,308	68.3	} Davenport 1921
1917-19: Inductees -----	54,359	68.1	76,427	68.2	36,790	68.0	51,525	67.8	
Separatees -----	9,757	68.4	11,317	68.4	1,214	68.2	3,575	68.3	
1940-53: Army-chemical warfare -----	522	68.2	146	68.0	54	68.9	46	68.9	Brues 1946
Army inductees -----	1,408	68.5	580	68.5	751	68.2	1,813	68.4	Newman 1955
Aviators -----	279	69.4	600	69.3	208	69.2	290	69.3	Herzberg 1954

¹ None under 65 inches.² Age 21 years and over.³ "Slave States."⁴ Kentucky and Tennessee.

TABLE 61.—MILITARY MEN: *Heights and weights by type of service and date of study, 1861–1955*

Type of service men	Date of study	Age		Cases	Average height	Average weight	First author and date of publication
		Range	Average				
		Years	Years	Number	Inches	Pounds	
U.S. volunteers.....	1861–63	18–45		25,878	68.2		Elliott 1863
Army of the Potomac.....	1862–63		24	1,700	67.1	147.5	
	1892–97	20–24		20,636	67.7	143.4	
	1892–97	25–29		10,136	67.6	146.6	Sternberg 1893–98
Army recruits (native white)....	1892–97	30–34		3,075	67.5	149.4	
	1892–97	35–39		1,607	67.3	151.1	
	1892–97	40–49		1,816	67.4	152.3	
Army officers.....	1901–16	21–45		8,790	69.1	154.5	Reed 1932
Army recruits.....	1917–18	21–30		872,931	67.5	141.5	Davenport 1921
Army separatees.....	1919	21–30		83,573	67.7	144.9	
Student officers.....	1923	20–29	20.8	478	68.3	146.4	Dunn 1928
Naval aviators.....	1940–41		27.6	1,002	70.3	167.9	McFarland 1944
	1940–45	18–19		6,206	68.4	147.6	Randall 1949a and n.p.
Army inductees and separatees....	1940–45	20–24		5,985	68.5	154.4	
	1940–45	25–29		13,145	68.4	157.8	
	1941–45	20–24		268	70.2	160.7	
	1941–45	25–29		2,869	70.0	163.5	McFarland 1953
Army air-transport pilots.....	1941–45	30–34		2,169	69.9	166.2	
	1941–45	35–39		1,232	69.9	169.5	
	1941–45	40–44		464	69.6	169.7	
Airforce cadets.....	1942	18–27	23.2	680	69.3	153.4	Damon 1946, 1955
Airforce gunners.....	1942	18–29	23.7	109	67.8	145.1	
Photo reconnaissance gunners....	1942	19–34	24.6	46	67.7	145.6	
Photo reconnaissance officers....	1942	20–27	23.7	151	69.5	157.0	
Airforce gunners.....	1944			564	68.6	150.1	
Bomber officers.....	1944			419	69.3	154.6	
Flight pilots.....	1944			315	68.6	148.4	
Bomber pilots.....	1945	20–30	24.9	80	70.0	160.6	
Fighter pilots.....	1945	20–29	24.2	76	68.6	153.1	
Aviator trainees.....	(1945–48)		22.3	515	69.7	158.8	
Army separatees.....	1946	15–40	23.9	24,554	68.4	154.8	Elbel 1949
Naval recruits.....	1952	17–25	19.0	2,173	68.6	152.4	Newman 1951
“Healthy young soldiers”.....	(1954–55)	17–25	22.1	88	67.9	150.5	Gibbons 1953a
Army (medical nutrition labora- tory).....	1955	20–24	21.3	93	68.8	155.4	Pascale 1956 Konishi 1956

TABLE 62.—KOREAN WAR CASUALTIES: *Heights at induction, 1950–53*¹

Age in years	Whites		Negroes		Mongolians		Mexicans		Puerto Ricans	
	Cases	Height	Cases	Height	Cases	Height	Cases	Height	Cases	Height
	Number	Inches	Number	Inches	Number	Inches	Number	Inches	Number	Inches
17-----	1,224	67.9	108	67.7	6	67.1	39	66.4	4	66.1
18-----	793	68.3	98	68.6	18	65.8	21	66.4	6	66.1
19-----	479	68.6	75	68.2	6	66.7	16	66.9	6	64.5
20-----	389	68.4	39	68.3	12	66.2	10	65.7	5	63.6
21-----	342	68.9	60	68.2	35	66.7	20	66.3	21	65.0
22-----	288	68.9	44	68.7						
23-----	190	68.9	28	67.8						
24-----	172	69.2	20	68.3						
25-----	145	69.4	26	68.6	7	67.1	6	66.6	16	66.4
26-30-----	399	69.0	48	68.6						
31-34-----	158	68.9	31	68.6					8	65.6
35-39-----	69	68.7								
40-46-----	24	67.7								

¹ Source: Trotter and Gleser (1958).

TABLE 63.—ARMY MEN: *Average weights for height and age, 1863-1946*

Group, when measured, and age at measurement	Weight for height of—											
	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Civil War Soldiers (1863-65): ¹												
20-24-----	131	134	138	142	146	150	154	-----	-----	-----	-----	-----
25-29-----	132	136	140	146	149	151	156	-----	-----	-----	-----	-----
30-34-----	135	133	143	145	148	155	158	-----	-----	-----	-----	-----
35-39-----	136	135	140	145	148	154	155	-----	-----	-----	-----	-----
40-49-----	136	138	141	147	146	155	158	-----	-----	-----	-----	-----
Draftees (1917-18): ²												
21-30-----	129	132	135	138	142	145	144	152	156	159	163	166
Army officers (1924): ³												
20-24-----		⁴ 139	145	146	149	152	154	157	159	⁴ 164	-----	-----
25-29-----	⁴ 140	142	142	147	152	153	157	161	168	171	170	-----
30-34-----	143	143	147	151	154	156	161	165	168	171	174	-----
35-39-----	146	147	152	153	154	159	163	167	172	172	⁴ 174	-----
40-44-----	149	151	152	153	160	161	166	167	173	178	⁴ 174	-----
45-49-----	⁴ 143	146	154	157	160	162	166	171	175	179	⁴ 177	-----
50-54-----	⁴ 148	⁴ 145	164	158	160	166	164	172	177	⁴ 174	-----	-----
55-59-----			⁴ 154	⁴ 162	159	165	172	⁴ 173	-----	-----	-----	-----
Army recruits (1943-44): ⁵												
18-19-----	128	131	135	138	142	146	150	154	158	162	166	170
20-24-----	133	137	140	143	147	151	154	158	162	166	170	174
25-29-----	139	142	145	149	153	156	160	164	168	172	176	180
30-34-----	142	145	148	152	155	159	163	166	170	174	178	182
35-37-----	143	146	150	153	157	160	164	168	172	176	181	185
Army separatees (1946): ⁶												
19-----	136	140	143	147	151	155	159	162	166	170	174	178
20-24-----	139	143	146	150	154	158	162	165	169	173	177	181
25-29-----	144	148	151	155	159	163	167	170	174	178	182	186
30-34-----	145	149	152	156	160	164	168	171	175	179	183	187
35-----	147	151	154	158	162	166	170	173	⁷ 175	181	185	189

¹ Source: Gould (1869).² Source: Davenport (1921).³ Source: Ireland (1926).⁴ Only 10 to 19 men in the group. Averages when less than 10 men in the group were omitted.⁵ Source: Karpinos (1958).⁶ Source: Newman (1952).⁷ Probably should be 177.

TABLE 64.—ARMY OFFICERS: Average weights ¹ for height and age, 1924 ²

Height in inches	20-24 years		25-29 years		30-34 years		35-39 years		40-44 years		45-49 years		50-54 years		55-59 years		60-64 years	
	Weight		Weight		Weight		Weight		Weight		Weight		Weight		Weight		Weight	
	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds
64	{ 6 2 4	{ 128 137 151	{ 12 19 1	{ 122 140 159	{ 17 34 3	{ 122 143 162	{ 12 27 5	{ 125 146 170	{ 8 27 3	{ 130 149 157	{ 7 16 5	{ 132 143 152	{ 4 12 1	{ 132 148 174	{ 1 4 1	{ 119 149 154	{ 1 — —	{ 124 — —
65	{ 10 14 1	{ 131 139 149	{ 21 37 6	{ 131 142 157	{ 29 60 6	{ 127 143 162	{ 20 48 7	{ 128 147 172	{ 12 38 11	{ 135 151 171	{ 12 35 4	{ 131 146 169	{ 4 15 4	{ 130 145 177	{ 1 5 2	{ 139 158 177	{ — — —	{ 149 — —
66	{ 12 23 1	{ 134 145 174	{ 55 84 6	{ 131 142 172	{ 77 161 12	{ 132 147 167	{ 46 107 10	{ 133 152 173	{ 31 93 15	{ 129 152 178	{ 16 78 15	{ 132 154 179	{ 9 20 10	{ 136 164 171	{ 9 11 3	{ 131 154 169	{ 1 1 —	{ 109 154 —
67	{ 16 37 2	{ 136 146 162	{ 74 147 15	{ 135 147 170	{ 88 277 32	{ 133 151 170	{ 53 174 16	{ 131 153 175	{ 47 137 25	{ 134 153 179	{ 20 104 12	{ 133 157 182	{ 16 55 7	{ 141 158 175	{ 4 18 4	{ 137 162 183	{ — — —	{ 158 164 —
68	{ 32 52 2	{ 138 149 164	{ 101 226 16	{ 136 152 173	{ 132 376 28	{ 136 154 174	{ 64 221 25	{ 134 154 183	{ 36 196 29	{ 138 166 182	{ 28 159 24	{ 137 160 182	{ 19 83 11	{ 140 160 185	{ 6 26 3	{ 136 159 184	{ 2 6 1	{ 147 170 199
69	{ 15 53 3	{ 136 152 169	{ 87 267 32	{ 138 153 177	{ 119 402 47	{ 138 156 183	{ 50 237 41	{ 142 159 187	{ 40 173 37	{ 139 161 195	{ 17 156 34	{ 140 162 188	{ 14 96 17	{ 139 166 189	{ 9 35 5	{ 141 169 197	{ — — —	{ 163 169 —
70	{ 12 56 1	{ 139 154 184	{ 77 236 25	{ 140 157 186	{ 95 351 43	{ 143 161 188	{ 43 213 38	{ 142 163 189	{ 30 173 39	{ 142 166 196	{ 16 153 32	{ 147 166 188	{ 6 64 19	{ 149 164 187	{ 1 21 7	{ 149 172 200	{ — — —	{ 172 194 —
71	{ 15 28 7	{ 144 157 213	{ 56 165 38	{ 146 161 185	{ 53 278 48	{ 144 165 185	{ 45 156 29	{ 146 167 188	{ 29 135 37	{ 143 167 193	{ 11 92 37	{ 139 171 192	{ 7 48 13	{ 142 172 193	{ 2 13 5	{ 157 173 189	{ 1 1 9	{ 139 164 202
72	{ 11 24 6	{ 151 159 170	{ 31 105 26	{ 151 168 185	{ 43 165 52	{ 151 168 189	{ 10 107 45	{ 156 172 198	{ 7 67 35	{ 147 173 196	{ 11 66 27	{ 143 175 193	{ 6 30 13	{ 159 177 194	{ 1 6 5	{ 164 177 190	{ — — —	{ 165 209 —
73	{ 2 12 4	{ 142 164 172	{ 17 68 22	{ 155 171 193	{ 13 81 26	{ 156 171 197	{ 2 39 11	{ 149 172 206	{ 7 28 24	{ 166 178 191	{ 6 21 13	{ 155 179 204	{ 1 12 8	{ 134 174 199	{ 1 4 1	{ 164 190 244	{ — — —	{ — — —
74	{ 2 2 7	{ 159 162 165	{ 9 22 15	{ 162 170 197	{ 13 37 17	{ 154 174 193	{ 3 15 14	{ 169 174 201	{ 11 7 7	{ 174 194 222	{ 2 10 5	{ 152 177 209	{ — — —	{ 190 190 197	{ — — —	{ 164 187 209	{ — — —	{ — — —

TABLE 64.—ARMY OFFICERS: *Average weights*¹ *for height and age, 1924*²—Continued

Height in inches	20-24 years		25-29 years		30-34 years		35-39 years		40-44 years		45-49 years		50-54 years		55-59 years		60-64 years	
	Weight		Weight		Weight		Weight		Weight		Weight		Weight		Weight		Weight	
	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds	Cases	Pounds
75-----	{ 1 5 2	{ 154 182 192	4 7 4	{ 159 173 195	2 8 13	{ 152 182 205	1 6 4	{ 149 182 178	6 3	{ 187 215	2 4	{ 189 215	1	{ 239				
76-----	{ ----- 1	{ ----- 199	1 3 3	{ 154 167 196	1 4 2	{ 144 175 199	1 3 1	{ 149 157 225	4 1	{ 168 204	1 4 4	{ 169 193 225						

¹ First weight represents men of "slight" build, second of "medium" build, and third of "heavy" build.

² Source: Ireland (1926).

³ Probably should be 198.

TABLE 65.—ARMY RECRUITS: *Average weights for height and age, 1943-44*¹

Height in inches	Weight for age					Height in inches	Weight for age				
	18-19 years	20-24 years	25-29 years	30-34 years	35-37 years		18-19 years	20-24 years	25-29 years	30-34 years	35-37 years
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>		<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
59-----	92 96 112 132 138	96 100 118 139 146	98 103 123 148 155	99 104 126 152 160	99 105 127 153 162	69-----	119 125 146 171 178	122 128 151 177 186	124 130 156 187 197	125 132 159 192 202	126 133 160 194 205
60-----	94 99 115 135 141	98 103 121 143 150	100 105 126 151 159	101 107 129 156 164	102 107 130 157 166	70-----	122 128 150 175 183	125 131 154 182 191	127 133 160 192 202	128 135 163 196 207	129 136 164 199 210
61-----	97 101 118 139 145	101 105 124 146 153	102 108 129 155 163	104 109 132 159 168	104 110 133 161 170	71-----	126 131 154 180 188	128 134 158 186 195	130 137 164 196 207	131 138 166 201 212	132 139 168 203 215
62-----	99 104 122 142 149	103 108 127 150 157	105 110 132 159 167	106 112 135 163 172	107 113 136 164 174	72-----	129 135 158 184 193	131 137 162 191 200	133 140 168 201 211	134 141 170 205 217	135 142 172 208 220
63-----	102 107 125 146 153	105 110 130 154 161	107 113 136 162 171	109 115 138 167 176	109 115 139 168 178	73-----	132 138 162 189 198	134 141 166 195 205	136 143 172 206 217	137 144 174 210 222	138 146 176 213 225
64-----	105 109 128 150 157	108 113 133 157 165	110 116 139 166 175	111 117 142 171 180	112 118 143 172 182	74-----	136 142 166 194 203	138 144 170 200 210	139 147 176 211 222	140 148 178 215 227	142 149 181 218 230
65-----	107 112 131 154 161	111 116 137 161 169	113 119 142 170 179	114 120 145 175 184	114 121 146 177 186	75-----	139 146 170 199 209	141 148 174 205 215	143 150 180 216 227	143 151 182 220 232	145 153 185 224 236
66-----	110 115 135 158 165	113 119 140 165 173	115 121 145 174 183	117 123 148 179 189	117 124 150 181 191	76-----	143 149 175 205 214	144 151 178 210 220	146 154 184 221 233	147 155 187 225 238	148 157 189 229 242
67-----	113 118 138 162 169	116 122 143 169 177	118 124 149 178 188	119 126 152 183 193	120 127 153 185 195	77-----	147 153 180 210 220	148 155 183 215 226	150 158 189 226 238	150 158 191 231 243	152 160 194 234 247
68-----	116 121 142 166 174	119 125 147 173 182	121 127 153 183 192	122 129 155 187 198	123 130 157 189 200	78-----	151 157 184 216 225	151 159 187 220 231	153 161 193 232 244	154 162 195 236 249	156 164 199 240 253

¹ Source: Karpinos (1958): The weight values were computed from the respective regression equations of the logarithms of weight in pounds on height in inches by age. The middle values represented expected mean values, those above and below the means ± 1.2816 and ± 1.6449 standard error of the estimate, covering within this range 80 and 90 percent, respectively, of the population around the mean.

TABLE 66.—ARMY SEPARATEES: *Average weights for height and age, 1946*¹

Age in years	Weight for height of—													
	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
19	128	132	136	140	143	147	151	155	159	162	166	170	174	178
20	129	133	137	141	144	148	152	156	160	163	167	171	175	179
21	130	134	138	142	145	149	153	157	161	164	168	172	176	180
22	131	135	139	143	146	150	154	158	162	165	169	173	177	181
23	132	136	140	144	147	151	155	159	163	166	170	174	178	182
24	133	137	141	145	148	152	156	160	164	167	171	175	179	183
25	134	138	142	146	149	153	157	161	165	168	172	176	180	184
26	135	139	143	147	150	154	158	162	166	169	173	177	181	185
27	136	140	144	148	151	155	159	163	167	170	174	178	182	186
28	136	140	144	148	151	155	159	163	167	170	174	178	182	186
29	136	140	144	148	151	155	159	163	167	170	174	178	182	186
30	137	141	145	149	152	156	160	164	168	171	175	179	183	187
31	137	141	145	149	152	156	160	164	168	171	175	179	183	187
32	137	141	145	149	152	156	160	164	168	171	175	179	183	187
33	137	141	145	149	152	156	160	164	168	171	175	179	183	187
34	138	142	146	150	153	157	161	165	169	172	176	180	184	188
35	139	143	147	151	154	158	162	166	170	173	² 175	181	185	189

¹ Source: Newman (1952); measured without clothing.² Probably should be 177.TABLE 67.—ARMY SEPARATEES AGED 25 YEARS: *Average weights for height and body build, 1946*¹

Height in inches	Weight for body build ²					
	Chest breadth ³			Bi-iliac diameter ⁴		
	Small	Medium	Large	Small	Medium	Large
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
60	(115)	(127)	(141)	(121)	(125)	(136)
61	(118)	(130)	(145)	(124)	(129)	(140)
62	122	134	148	127	132	144
63	125	137	152	130	136	147
64	128	141	156	133	139	151
65	132	144	160	136	143	155
66	135	148	163	140	147	159
67	138	151	167	143	150	162
68	142	154	171	146	154	166
69	145	158	174	149	157	170
70	148	161	178	152	161	173
71	152	165	182	155	164	177
72	155	168	185	158	168	181
73	158	172	189	162	171	184
74	162	175	193	165	175	188
75	165	179	197	168	179	192
76	(168)	(182)	(200)	(171)	(182)	(196)
77	(172)	(186)	(204)	(174)	(186)	(199)
78	(175)	(189)	(208)	(177)	(189)	(203)

¹ Source: White (1956); measured without clothing.² Values in parentheses were extrapolated.³ Limits of chest breadth groups for height of 60 inches are as follows: Small, below 10.0 inches; medium, 10.0 to 11.0 inches; and large, above 11.0 inches. At 78 inches the limits are: Small, below 11.5 inches; medium, 11.5 to 12.5 inches; and large, above 12.5 inches.⁴ Limits of bi-iliac groups for height of 60 inches are as follows: Small, below 9.9 inches; medium, 9.9 to 11.0 inches; and large, above 11.0 inches. At 78 inches, the limits are: Small below 11.9 inches; medium, 11.9 to 13.0 inches; and large, above 13 inches.

larger and older ones to lose, so that at the end of the 11 weeks of training there was greater homogeneity in weights for the group than at the beginning. Newman (1951) also had found that the lighter men increased in girth, and the heavier ones decreased during training.

White, in 1956, published a table of smoothed data representing mean weights of 25-year-old army men

of different heights and body build (table 67). The basic data used in his analysis were for about 2,650 American-born white separatists in 1946, measured without clothing. The weights for given heights were determined for various chest breadths and bi-iliac diameters and smoothed values were calculated. His definition of small, medium, and large diameters are included in table 67.

SECTION IV.—DATA FROM OTHER COUNTRIES COMPARED WITH DATA FROM THE UNITED STATES

Questions that naturally arise are (1) how does size of adults in the United States compare with that of adults in other countries, and (2) have average heights of adults in other countries increased as they have in the United States over the years. Data to help to answer these questions are available from Canada, Great Britain, Sweden, Denmark, and Norway.

Canadian data are not available over the years, but in 1953 under Pett's direction a sample of Canada's population was selected "by an area stratification plan, proportionate to population density." Data for this sample of over 22,000 Canadians, measured without shoes but in other indoor clothing, were reported by Pett in 1955 and 1956. Average heights and weights for different age groups of men and women are shown in table 68 and average weights for given heights and ages, in tables 69 and 70.

Secular changes in the height of British adults

TABLE 68.—CANADIAN MEN AND WOMEN: *Average heights and weights for age, 1953*¹

Age in years	Men		Women	
	Height	Weight	Height	Weight
	Inches	Pounds	Inches	Pounds
16-17-----	66.7	136	62.5	120
18-19-----	68.0	144	62.6	124
20-24-----	67.9	154	62.8	124
25-29-----	68.3	160	62.7	126
30-34-----	68.0	167	62.8	130
35-44-----	67.5	167	62.4	135
45-54-----	66.9	164	61.8	144
55-64-----	66.0	161	61.3	147
65 and over-----	65.4	155	60.6	138

¹ Source: Pett (1955); Measured in ordinary indoor clothing, without shoes.

have been summarized by Boyne and Leitch (1954). As they reported, Beddow in 1870 estimated the average height of Englishman to be 66.6 inches, Scots 67.5 inches, and an overall average of 66.7

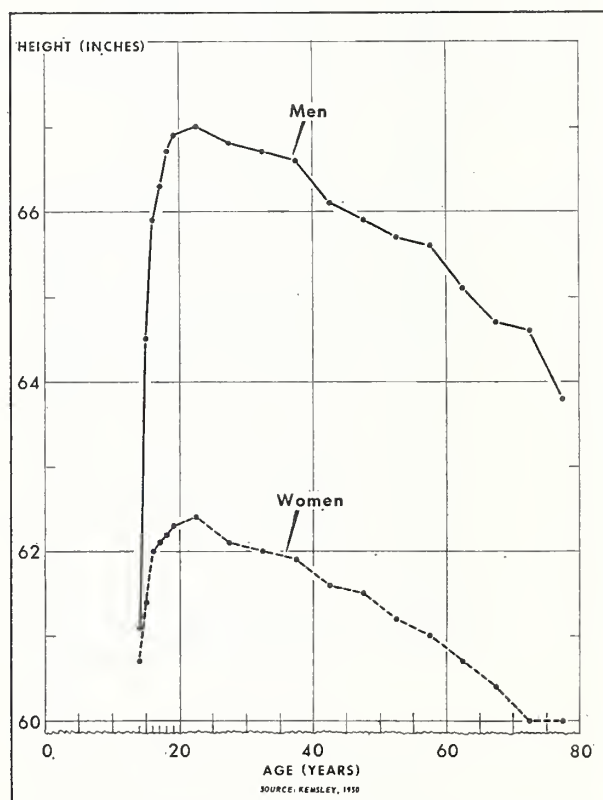


FIGURE 22.—Heights for age of British men and women, 1943.

inches. The survey of the British Association Anthropometric Committee (1881-1883) gave values for Scots of 68.7 inches, Irish 67.9 inches, English 67.4 inches, Welsh 66.7 inches, overall 67.7 inches. The next provincial study reported was that made under

TABLE 69.—CANADIAN MEN: *Average weights for height and age, 1953*¹

Age in years	Weight for height of—																
	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches	72 inches	73 inches	74 inches	75 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
15	92	97	102	106	111	116	121	125	130	135	139	144	148	153	158	163	167
16-17	99	103	108	113	118	122	127	132	136	141	146	151	155	160	165	169	174
18-19	116	119	122	125	128	131	134	138	141	144	147	150	153	156	160	163	166
20-24	121	124	127	131	134	138	142	145	149	152	156	159	163	166	170	173	177
25-29	128	132	135	139	142	146	149	153	156	160	163	167	170	174	177	181	184
30-34	134	138	141	145	148	152	156	159	163	166	170	173	177	181	184	188	191
35-44	135	139	142	146	150	153	157	161	164	168	172	175	179	183	186	190	194
45-54	127	132	136	141	146	150	155	160	165	169	174	179	183	188	193	197	202
55-64	138	141	144	148	151	154	157	160	163	166	169	172	176	179	182	185	188
65 and over	126	130	135	140	144	149	154	158	163	167	172	177	181	186	191	195	200

¹ Source: Pett (1955); weights in ordinary indoor clothing, without shoes.

TABLE 70.—CANADIAN WOMEN: Average weights for height and age, 1953¹

Age in years	Weight for height of—															
	56 inches	57 inches	58 inches	59 inches	60 inches	61 inches	62 inches	63 inches	64 inches	65 inches	66 inches	67 inches	68 inches	69 inches	70 inches	71 inches
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
15	96	99	101	104	107	109	112	115	117	120	123	126	128	131	134	136
16-17	105	107	110	112	115	117	120	122	125	127	130	132	135	137	140	142
18-19	100	103	107	110	114	118	121	125	129	132	136	140	143	147	151	154
20-24	106	108	111	113	116	118	121	123	126	128	131	133	136	138	141	143
25-29	110	112	114	117	119	122	124	127	129	132	134	137	139	141	144	146
30-34	115	117	119	122	124	126	129	131	133	136	138	140	143	145	147	150
35-44	126	127	128	130	131	133	134	135	137	138	140	141	143	144	145	147
45-54	130	132	134	137	139	142	144	146	149	151	153	156	158	160	163	165
55-64	134	137	139	141	144	146	148	151	153	155	158	160	162	165	167	169
65 and over	120	124	128	132	136	140	144	148	152	157	161	165	169	173	177	181

¹ Source: Pett (1955); weights in ordinary indoor clothing, without shoes.

TABLE 71.—BRITISH MEN AND WOMEN: *Average heights and weights for age, 1943*¹

Age in years	Men			Women		
	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds
16-----	1,404	64.5	112	1,378	62.0	110
17-----	1,644	65.9	120	1,699	62.1	113
18-----	1,280	66.3	124	1,724	62.2	114
19-----	786	66.7	128	1,535	62.3	116
20-----	591	66.9	131	1,376	62.3	116
21-----	467	66.9	132	1,284	62.4	118
22-----	460	67.3	136	1,224	62.4	117
23-----	477	67.0	135	1,250	62.4	118
24-----	368	66.8	135	1,048	62.3	117
25-29-----	1,962	66.8	136	4,241	62.1	117
30-34-----	3,139	66.7	138	3,970	62.0	120
35-39-----	3,414	66.6	139	3,715	61.9	122
40-44-----	3,557	66.1	137	3,205	61.6	126
45-49-----	2,528	65.9	137	2,339	61.5	128
50-54-----	2,123	65.7	137	1,589	61.2	130
55-59-----	1,246	65.6	138	646	61.0	130
60-64-----	625	65.1	137	227	60.7	127
65-69-----	193	64.7	136	83	60.4	123
70-74-----	42	64.6	136	37	60.0	119
75+-----	12	63.8	125	16	60.0	118

¹ Source: Kemsley (1950); measured without clothing.

the Military Training Act of 1939, on the measurements of 90,000 young men between 20 and 21 years old. In this report the English were 67.5 inches tall, the Welsh 67.1 inches, and the Scots 67.0 inches. Kemsley's (1950) data for the civilian population in 1943 gave maximum average values of 67.3 inches for men at 22 years and 62.4 inches for women in their early 20's. These latest height data are shown in table 71 and figure 22. Boyne and Leitch's conclusion was that "in Britain our information is inadequate to show directly by comparing different series of records whether the mean maximum stature of the population has increased over the last 100 years or not."

Morant (1950) considered that the best estimate of the maximum mean height of British men was 76.5 inches, unchanged over the last 100 years. He considered that a decline in height began soon after the maximum, and that since the maximum was reached at 26 years in 1880, and at 21.5 years in 1945, the decline starts earlier now than previously. Boyne and Leitch (1954), on the other hand, agree with earlier British workers that the decline does not come before age 50 years.

Swedish data are based on measurements by Holmgren (1952) of outpatients in the Seraphim Hospital from 1914 to 1930. Figure 23 shows yearly

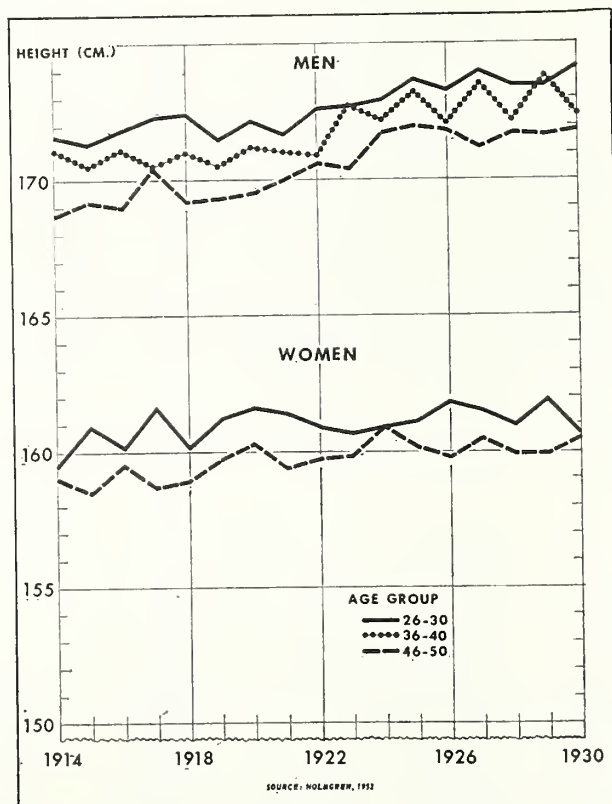


FIGURE 23.—Heights of Swedish men and women, hospital outpatients, 1914-30.

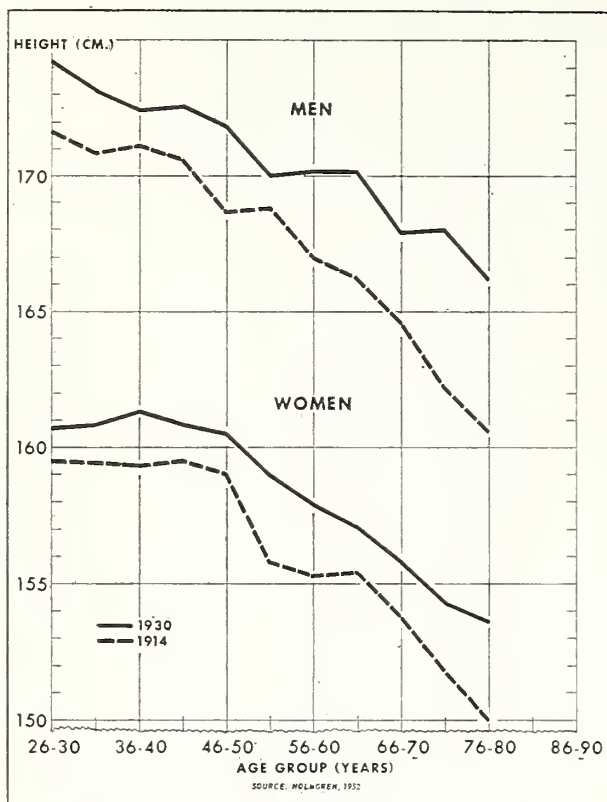


FIGURE 24.—Heights for age of Swedish men and women, hospital outpatients in 1914 and 1930.

averages over the 17-year period for heights of men in three age groups, 26–30, 36–40, and 46–50 years, and for women 26–30 and 46–50 years. The men showed an increase of roughly 2.5 cm. (1 inch) over the period. The younger women increased about 2.2 cm.; the older group, nearly 3 cm. In figure 24 it is evident that both men and women over about 50 years of age were shorter on the average with each additional 5 years of age, and that they were from 1 to 3.5 cm. shorter for each age group in 1914 than

in 1930. The greatest average heights in 1930 were 174.2 cm. (68.6 inches) for men aged 26–30 years and 161.3 cm. (63.5 inches) for women 36–40 years.

Abramson in 1956 published height-weight values for Swedish women. Again the women from 35 to 39 years old were the tallest, but they averaged 163.2 cm., or 64.3 inches, evidence that Swedish women, too, were taller in the 1950's than in the 1930's (63.5 inches). He concluded from his study that women in a higher income group (over \$3,000) when compared with those of a lower income group (under \$1,000) on the average were taller by 2.50 cm. and were also more slender. They reached their maximum weight at about 35 years. He considered that the lesser height of older persons is mainly attributable to the fact that they were shorter in youth than persons born later. Both of these conclusions agree with our findings for women in the United States.

Data for Danish men from 18 to 25 years of age examined for the Danish military forces from 1911 to 1952 are presented in figure 25, as reported by Boyne and Leitch (1954). The data show clearly the increase in average height of these young men over the years—from 169 to 172 cm. (66.5 to 67.7 inches) for those born in 1893, to 173 to 175 cm. (68.1 to 68.9 inches) for those born in 1927, an average increase of at least an inch in 35 years to about 68.5 inches in 1952.

The Norwegian data of Lindberg and associates (1956) for average measurements of 11,173 men and 3,847 women in 1952, by 10-year-age periods are presented in table 72. Army recruits measured in 1952, 1937, 1930, 1920, and 1910 had heights of 69.4, 68.4, 68.0, 67.5, and 67.3 inches, respectively. These heights correspond roughly to those given in table 72 for men measured in 1952, who were 20–29 years of age in 1952, 1937, 1930, 1920, and 1910; i.e., those

TABLE 72.—NORWEGIAN MEN AND WOMEN: *Average heights and weights for age, 1952*¹

Age in years	Men			Women		
	Cases	Height	Weight	Cases	Height	Weight
	Number	Inches	Pounds	Number	Inches	Pounds
Under 20	736	68.1	139.2	579	64.5	130.9
20–29	2,355	69.4	154.1	1,400	64.6	132.6
30–39	2,973	69.0	158.2	719	64.2	138.1
40–49	2,271	68.3	158.8	602	63.7	143.3
50–59	1,841	67.6	159.4	431	63.1	147.8
60–69	997	67.1	158.6	116	62.6	145.5

¹ Adapted from data of Lindberg and associates (1956).

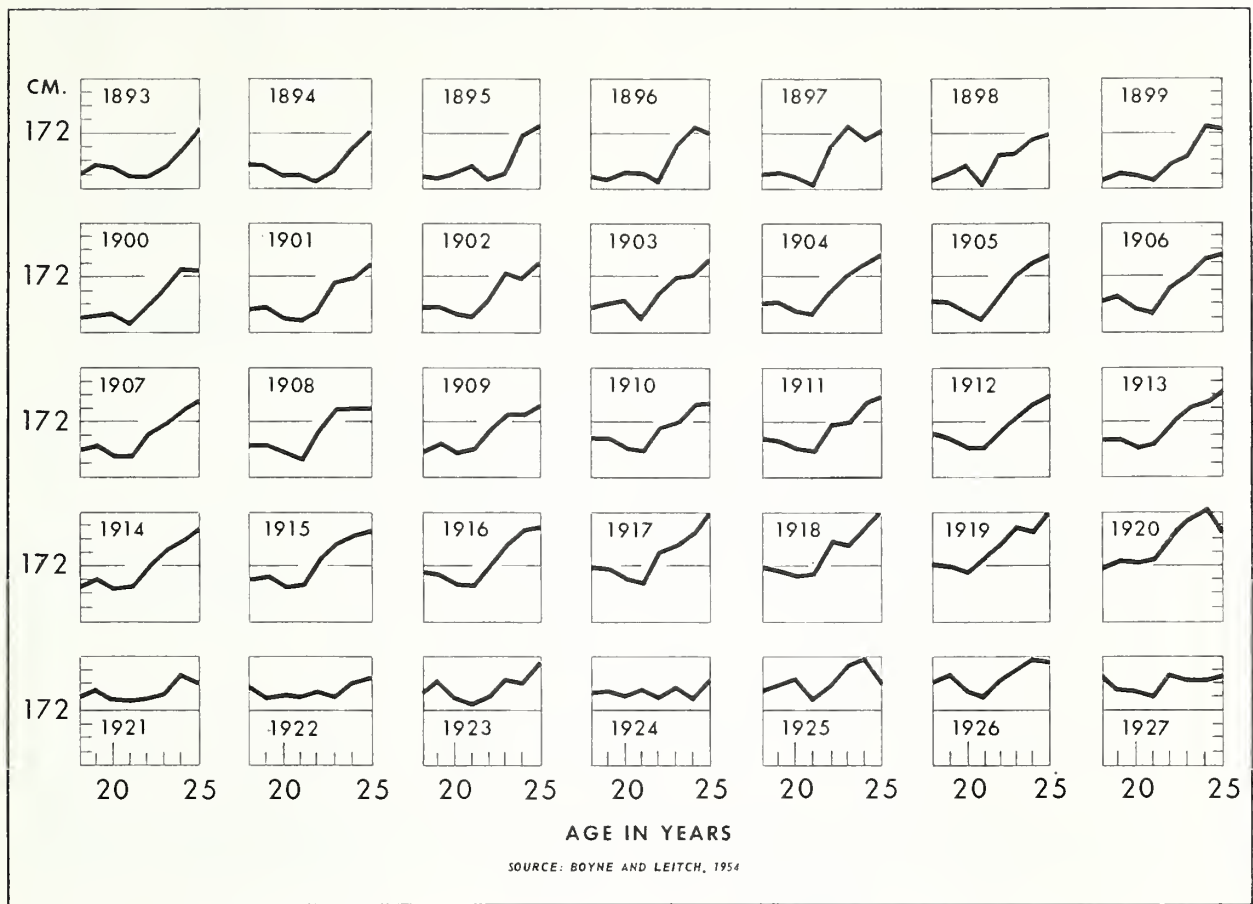


FIGURE 25.—Heights for age of Danish men at ages 18–25 years, by year of birth, 1893–1927.

TABLE 73. NORWEGIAN MEN AND WOMEN: *Average weights for height, 1952*¹

Height in inches	Weights for men			Weights for women		
	Low ²	Norm	High ²	Low ²	Norm	High ²
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
60				107	119	131
61				111	123	135
62				114	127	140
63	119	132	145	117	130	143
64	122	136	150	121	134	147
65	126	140	154	124	138	152
66	130	144	158	128	142	156
67	133	148	163	131	145	160
68	137	152	167	134	149	164
69	139	155	171	138	153	168
70	143	159	175	140	156	172
71	147	163	179	144	160	176
72	150	167	184	³ (148)	³ (164)	³ (180)
73	154	171	188			
74	157	175	193			
75	161	179	197			
76	165	183	201			

¹ Adapted from Lindberg and associates (1956).

² "Low" is 10 percent below the norm; "high" 10 percent above the norm.

³ Estimated values.

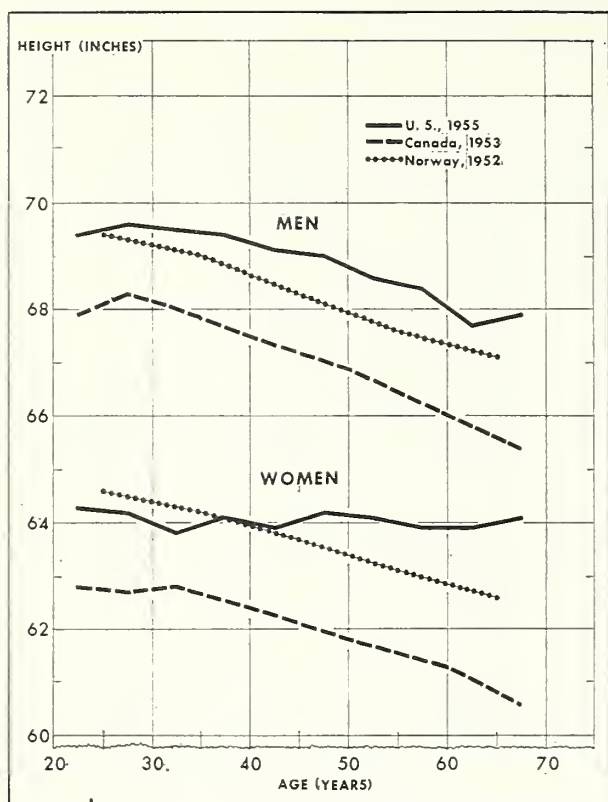


FIGURE 26.—Heights for age of Canadian, Norwegian, and United States men and women measured between 1952 and 1955.

20-29, 30-39, 40-49, 50-59, and 60-69 years of age (69.4, 69.0, 68.3, 67.6, and 67.1 inches). This also would indicate that decrease in height of men with increased age was due to failure of men to reach the greater heights rather than shrinkage with age.

Values from other studies on heights of Norwegian women aged 20-29 years in 1954, 1932, and 1922 were 65.2, 64.1, and 63.9 inches, respectively. These heights are well within the range of those in table 72 for women who were in the age group of 20-29 years in 1952, 1932, and 1922; i.e., those 20-29, 30-39, and 40-49 years of age (64.6, 64.2, and 63.7 inches).

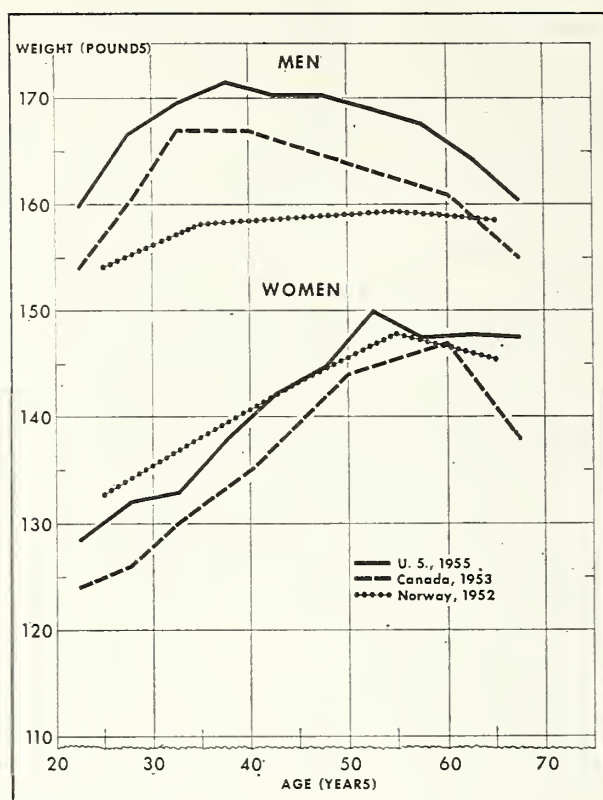


FIGURE 27.—Weights for age of Canadian, Norwegian, and United States men and women measured between 1952 and 1955.

Lindberg and associates (1956) also prepared a table of standards for weights for heights of Norwegians based on their 1952 study. Their data converted into English units are presented in table 73.

Figures 26 and 27 compare recent data for heights and weights of men and women in Canada, Norway, and the United States. Canadians were the shortest of the three nationalities, Norwegians next, except for women aged 25 to 35 years, and those from the United States the tallest. The Canadian men and women were heavier and Norwegian men lighter than would be expected for their heights.

SECTION V.—CHANGES IN UNITED STATES POPULATION BETWEEN 1790 AND 1950

Any attempt to explain changes in the average heights and weights of the population of the United States must take into consideration the great changes that have taken place both in the extent of the United States territory and the increase in population living within its boundaries. The total area of continental

United States was 867,980 square miles in 1790, when the first census was taken. The census covered only 417,170 square miles—the States now in the Northeast Region, plus Maryland, the District of Columbia, Delaware, Virginia, West Virginia, Kentucky, Tennessee, North and South Carolina,

and part of Georgia. The total population of that area was 3,929,214 persons. By the 1920 census the territory covered 2,973,776 square miles, about the present area of continental United States, and the population was 105,710,620 persons, or 7.1 times the territory and 27 times the population in 1790. In 1950 the total population was 150,697,361 persons, or 38.4 times that of 1790.

During the first 70 years, from 1790 to 1860, the per decade increase in the population was 33 to 36 percent; during the next 30 years, from 1860 to 1890, about 26 percent; from 1890 to 1910, about 21 percent; from 1910 to 1930, 15 and 16 percent; and from 1930 to 1950, an average of about 11 percent per decade. The uniformly high rate of increase from 1790 to 1860 was primarily due to the development of the new nation, the pioneering stage of our expansion. Figure 28 shows three peaks in immigration reported for the decades 1851-60, 1881-90, and 1901-10. The increases in the last half of the 19th century were due largely to Irish famines and unrest

in Germany; the increase early in the 20th century, to the Industrial revolution and the demand in this country for unskilled labor. During the period 1911-20 there was quite a decrease in immigration due to World War I, and then a marked decrease from 1921 to 1940 due to legislation of 1921 and 1924 restricting the number of foreigners admitted. Since 1940 there has been an increase due to relaxing of the legislation of the 1920's to admit some refugees, but it has not reached the numbers accepted 100 years ago.

Detailed data on immigration into the United States have been summarized by Rossiter (1909, 1922), Carpenter (1927), Stewart (1946), and Hutchinson (1956). Before 1850 the immigrants were generally of the same stock as the population in 1790, largely British with some Dutch, French, Irish, and German. Between the censuses of 1850 and 1950 the immigration from Europe decreased only from 90 to 81 percent, but the distribution within European countries changed materially (table 74).

The number of immigrants from Northwestern

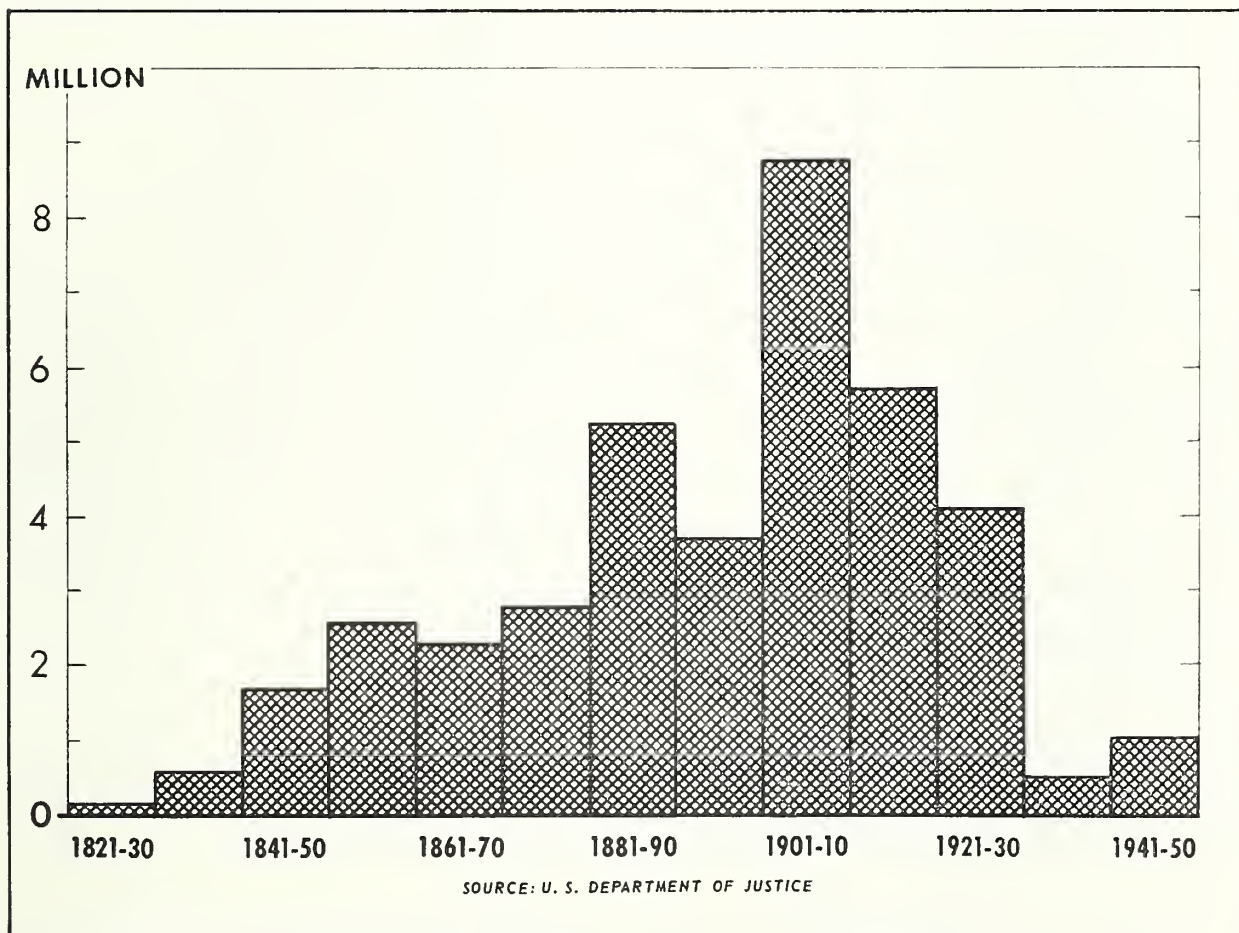


FIGURE 28.—Decennial immigration to the United States, 1821-1950.

TABLE 74.—FOREIGN-BORN POPULATION IN THE UNITED STATES: *By country of birth, 1850–1950*¹

Country of birth	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950
	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent	Percent
Total foreign-born-----	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Europe-----	90.5	92.0	88.5	85.9	86.6	85.8	87.1	86.8	84.0	84.7	81.2
Northwestern-----	64.0	59.8	55.8	52.2	47.2	40.6	31.3	28.2	26.8	24.7	22.9
Great Britain-----	16.8	14.2	13.8	13.6	13.5	11.3	9.0	8.3	8.7	8.1	8.2
Ireland-----	42.8	38.9	33.3	27.8	20.2	15.6	10.0	7.6	6.6	5.9	5.2
Scandinavia-----	0.9	1.8	4.3	6.6	10.1	10.4	9.2	8.7	8.1	7.4	6.3
Low Countries-----	0.5	0.9	1.0	1.3	1.1	1.2	1.3	1.6	1.6	1.6	1.6
Switzerland-----	0.6	1.3	1.3	1.3	1.1	1.1	0.9	0.9	0.8	0.8	0.7
France-----	2.4	2.7	2.1	1.6	1.2	1.0	0.9	1.1	1.0	0.9	1.1
Central-----	26.0	31.6	32.1	32.2	35.0	35.1	34.0	31.5	30.3	30.5	29.0
Germany-----	26.0	30.8	30.4	29.4	30.1	25.8	17.1	12.3	11.5	10.8	9.7
Poland-----		0.2	0.3	0.7	1.6	3.7	6.9	8.3	9.1	8.7	8.5
Czechoslovakia-----								2.6	3.5	2.8	2.7
Austria-----		0.6	1.3	1.9	2.6	4.2	6.3	4.2	2.7	4.2	4.0
Hungary-----			0.1	0.2	0.7	1.4	3.7	2.9	2.0	2.5	2.6
Yugoslavia-----								1.2	1.5	1.4	1.4
Eastern-----	0.1	0.1	0.1	0.5	2.0	4.9	10.6	13.1	11.8	12.9	12.5
Russia-----	0.1	0.1	0.1	0.5	2.0	4.1	8.8	10.2	8.2	9.1	8.8
Latvia, Esthonia-----									0.1	0.2	0.4
Lithuania-----									1.0	1.4	1.5
Finland-----									1.1	1.0	0.9
Rumania-----						0.1	0.5	0.7	1.0	1.0	0.8
Bulgaria-----							0.1	0.1	0.1	0.1	0.1
Turkey-----						0.1	0.2				
Southern-----	0.4	0.5	0.5	0.9	2.3	5.2	11.2	13.9	14.9	16.5	16.6
Greece-----						0.1	0.7	1.3	1.2	1.4	1.7
Italy-----	0.2	0.3	0.3	0.7	2.0	4.7	9.9	11.7	12.8	14.2	14.0
Spain and Portugal-----	0.2	0.2	0.2	0.2	0.3	0.4	0.6	0.9	0.9	0.9	0.9
Other Europe-----				0.1	0.1			0.1	0.2	0.2	0.3
Asia-----		0.9	1.1	1.6	1.2	1.1	1.3	0.8	1.0	1.3	1.8
Asia Minor-----							0.4	0.5	0.7	1.0	1.1
China and Japan-----		0.9	1.1	1.6	1.2	1.0	0.9				
Other Asia-----						0.1		0.3	0.3	0.3	0.6
America-----	7.6	7.0	10.0	12.0	11.8	12.6	10.9	12.0	14.5	13.2	15.4
Canada-----	6.6	6.0	8.9	10.7	10.6	11.4	8.9	8.1	9.2	9.1	9.7
Newfoundland-----								0.1	0.2	0.2	
Mexico-----	0.6	0.7	0.8	1.0	0.8	1.0	1.6	3.5	4.6	3.3	4.4
West Indies-----	0.3	0.2	0.2	0.2	0.3	0.2	0.3	0.2	0.2	0.2	0.5
Central America-----									0.1	0.1	0.2
South America-----	0.1	0.1	0.1	0.1	0.1		0.1	0.1	0.2	0.3	0.4
All other-----	1.9	0.2	0.3	0.3	0.3	0.3	0.5	0.4	0.5	0.5	1.4

¹ Adapted from Carpenter (1927) and Hutchinson (1956). See Hutchinson (1956) appendixes A and B for information relating to reporting of nativity and parentage, color or race, and country of origin for censuses. Data for 1920–1950 are for foreign-born white population only. Percentages less than 0.1 have been omitted throughout.

Europe decreased from 64 to 23 percent between 1850 and 1950, primarily due to the decrease in the percentage of Irish. In 1850 they made up nearly 43 percent of the foreign-born, but 100 years later their percentage had decreased gradually to 5.2 percent.

Immigration from Central Europe showed relatively little change over the 100 years, increasing from 26 percent in 1850 to 35 percent in 1890 and 1900 and then decreasing to 29 percent in 1950. However, the country of origin of the immigrants changed materially during this period. Most of the immigrants were from Germany up to 1890, but their percentage decreased gradually to about 10 percent in the 1940 and 1950 censuses. Immigrants from Poland showed the greatest increase from this area—from less than 1 percent before 1890 to about 9 percent in 1930 to 1950. Smaller percentage increases were found from Austria, Hungary, Czechoslovakia, and Yugoslavia—enough to keep the total from Central Europe at about the same level.

Increased immigration came from Eastern and

Southern Europe—from less than 1 percent from these two regions as late as 1870, up to 29 percent in 1950. This was largely due to increased immigration from Russia and Italy (to about 9 and 14 percent, respectively), with small increases from other countries in these areas.

The only other country with appreciable immigration to the United States was Canada, with a range from 6 to 11 percent over the 100-year period. There has been some immigration from Mexico (4 percent in 1950), but less than 1 percent from any other area in the Americas.

Table 75 presents the percentage distribution and figure 29 the actual distribution of the population of the United States by nativity and parentage. From 1850 to 1910 the native-born white population ranged from 72.6 to 74.6 percent of the total, increasing gradually to 82.8 percent at the 1950 census. The change was due primarily to a decrease in the number of foreign-born whites and consequent increase in native-born whites of native parentage

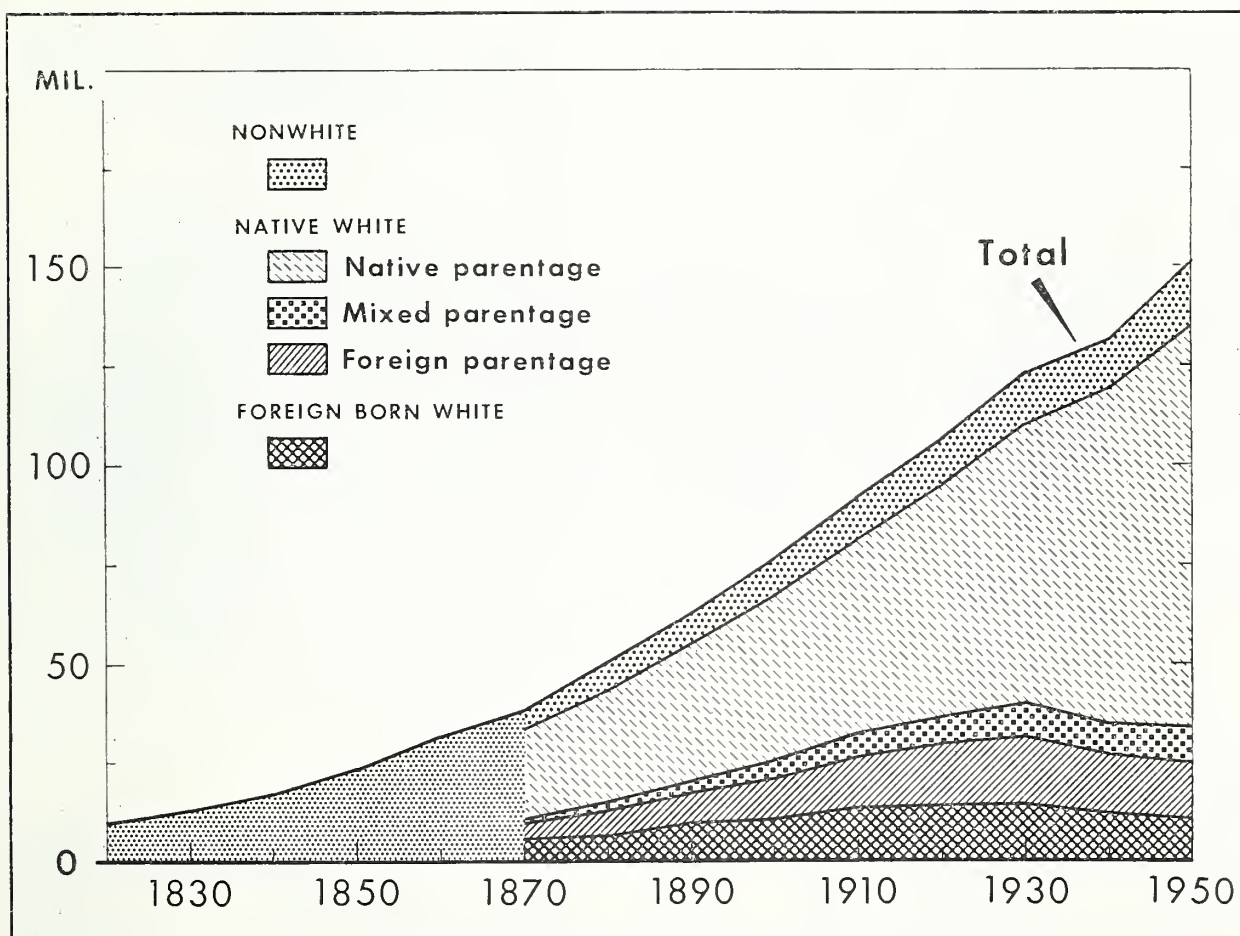


FIGURE 29.—Decennial population of the United States, 1821-1950.

TABLE 75.—TOTAL POPULATION OF THE UNITED STATES: *Distribution by nativity and parentage, 1850–1950*¹

Nativity and parentage	1850	1860	1870	1880	1890
Total population.....number..	23,191,876	31,443,321	² 38,558,371	50,155,783	62,947,714
Native white total.....percent..	74.6	72.6	72.9	73.5	73.0
Native parentage.....percent..	-----	-----	³ 59.1	57.0	54.8
Foreign parentage.....percent..	-----	-----	³ 10.8	12.7	12.8
Mixed parentage.....percent..	-----	-----	³ 3.0	3.8	5.4
Foreign-born white.....percent..	9.7	13.0	14.2	13.1	14.5
All other ⁴percent..	15.7	14.4	12.9	13.5	12.5

	1900	1910	1920	1930	1940	1950
Total population.....number..	75,994,575	91,972,266	105,710,620	122,775,046	131,669,275	150,697,361
Native white total.....percent..	74.5	74.4	76.7	78.4	81.3	82.8
Native parentage.....percent..	53.9	53.8	55.3	57.3	63.7	67.2
Foreign parentage.....percent..	14.0	14.0	14.8	14.2	11.5	9.8
Mixed parentage.....percent..	6.6	6.5	6.6	6.9	6.1	5.8
Foreign-born white.....percent..	13.4	14.5	13.0	11.4	8.7	6.7
All other ⁴percent..	12.1	11.1	10.3	10.2	10.0	10.5

¹ Adapted from data by Carpenter (1927) and Hutchinson (1956).² Enumeration of 1870 is considered incomplete.³ Partly estimated.⁴ Includes Negroes, Indians, Chinese, Japanese, and all other nonwhite.

from about 1920 to 1950. The proportion of other races (Negro, Indian, Chinese, Japanese, and so forth) decreased gradually from about 16 percent in 1850 to about 10 percent since 1920.

These changes in population help to explain some of the differences in stature of people in the United States. Average heights and weights of soldiers from various nations at demobilization in 1919 are shown in table 76. Men from the United States, England, Scotland, Ireland, and Germany averaged from 67.5 to 67.9 inches, while those from Poland and France were at least an inch shorter and the Italians and Hebrews at least 2 inches shorter than those from the United States. Since the greatest change in the number of immigrants after 1880 was a decrease in

those from Ireland and Germany, who were tall, and a marked increase in those from Italy and Russia, who were much shorter, it is not surprising that United States soldiers in World War I in 1917–19 averaged less than those in the Civil War in the 1860's.

Figures 30 and 31 show the relative concentration of foreign-born to the total white population by States in 1920 and 1950, and figures 32 and 33, the relative concentration of native-born whites of foreign and mixed parentage by States in 1920 and 1950. These figures illustrate why people in the Northeast and in the Southwest tend to be shorter than those from other areas. Those from the South tend to be taller, because there was very little influx of foreign-born into that region. Inter-marriage of native-born of native parentage with foreign-born or native-born of foreign stock has produced a large group of native-born of mixed parentage in this country. This may account to some extent for the increase in size since 1918. It cannot account for the increased proportion of men 6 feet and over, however, because the foreign-born are generally shorter rather than taller than the native-born.

Some data are available showing the effect on heights and weights of immigration of young people to the United States, and also on these measurements for children of such immigrants born in the United States. The nationalities represented in the various studies included in table 77 are Bohemians, Hebrews,

TABLE 76.—SOLDIERS OF VARIOUS NATIONALITIES: *Average heights and weights at demobilization, 1919*¹

Nationality	Cases	Height	Weight
	<i>Number</i>	<i>Inches</i>	<i>Pounds</i>
German.....	6,767	67.7	148.2
Polish.....	2,225	66.7	145.6
English.....	3,608	67.8	145.0
Scottish.....	1,821	67.9	144.9
Irish.....	4,907	67.5	143.0
French.....	746	66.4	142.2
Italian.....	3,075	65.0	138.0
Hebrew.....	1,531	65.7	137.8
United States.....	102,304	67.7	144.9

¹ Source: Davenport and Love (1921).

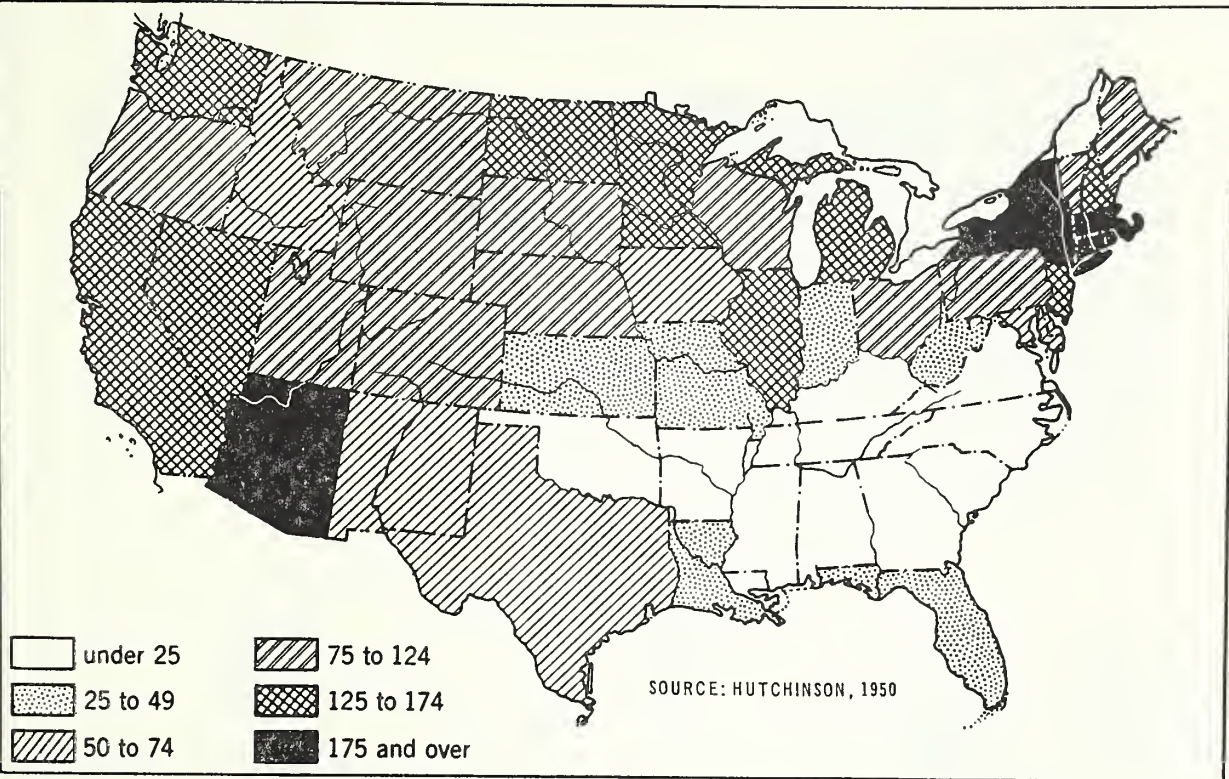


FIGURE 30.—Relative concentration of foreign-born white population by States, 1920.

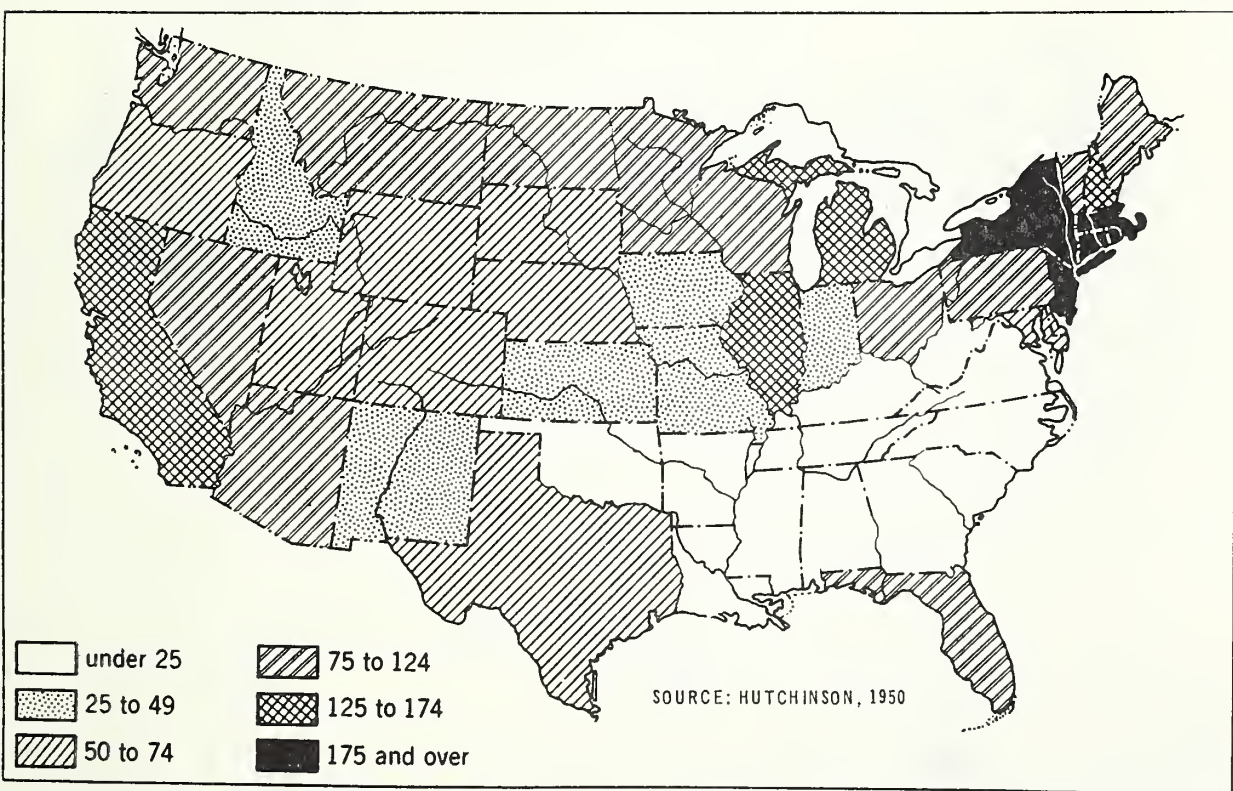


FIGURE 31.—Relative concentration of foreign-born white population by States, 1950.

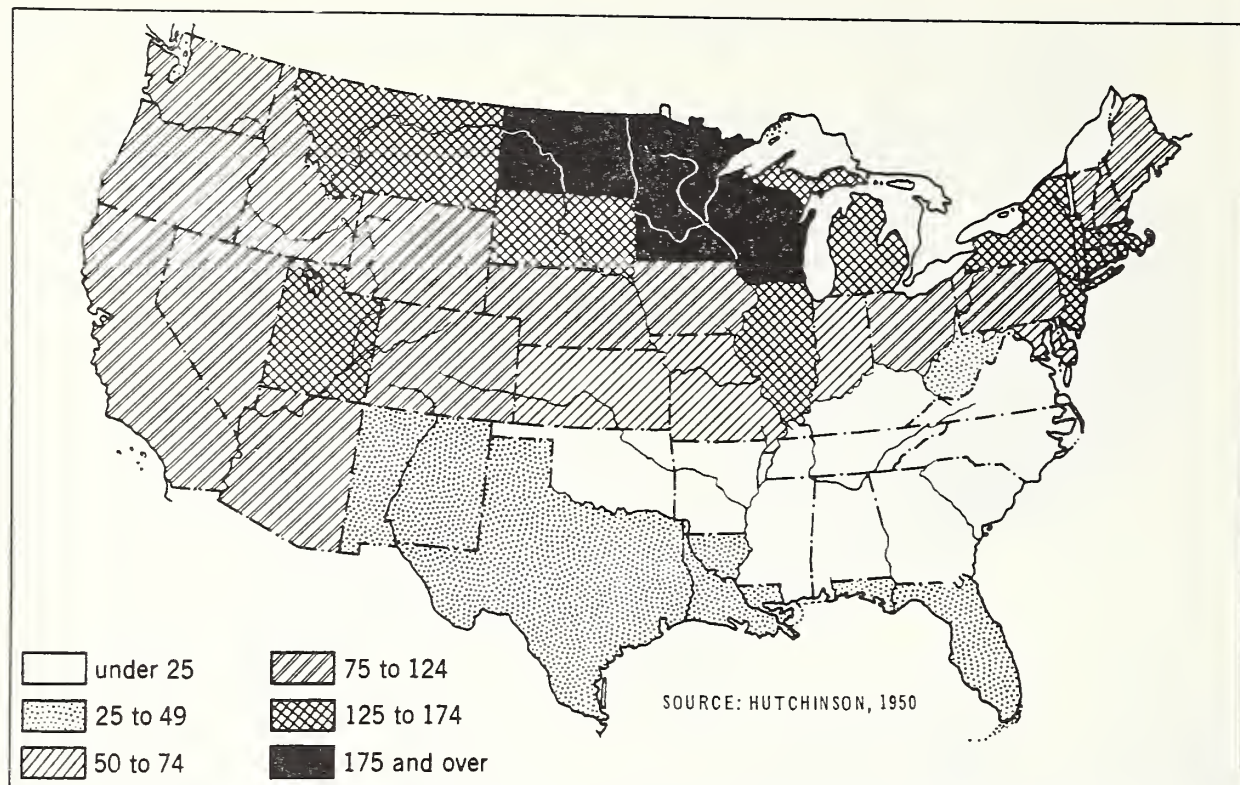


FIGURE 32.—Relative concentration of native white population of foreign and mixed parentage by States, 1920.

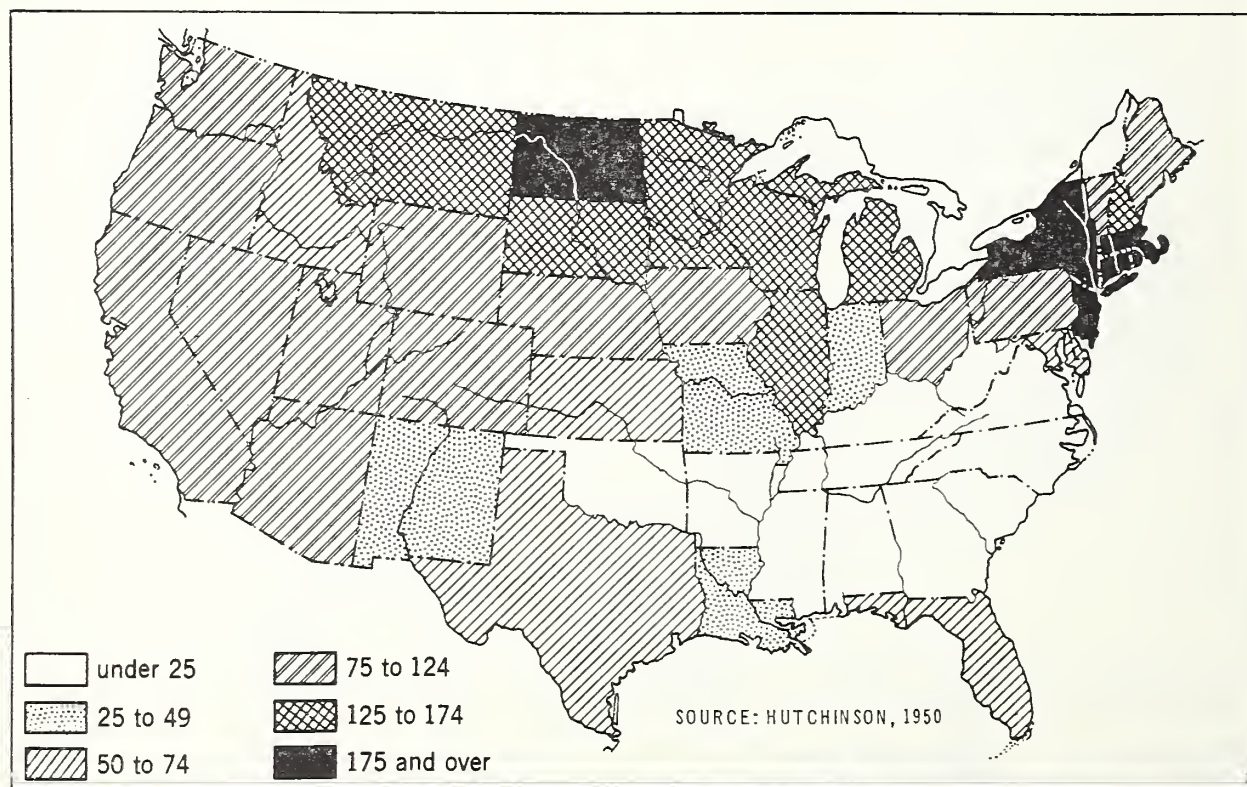


FIGURE 33.—Relative concentration of native white population of foreign and mixed parentage by States, 1950.

TABLE 77.—SEDENTES, IMMIGRANTS, AND THEIR CHILDREN BORN IN THE UNITED STATES: *Average heights*

MEN

Nationality	Sedentes ¹			Immigrants			Native-born U.S.			First author and date of publication
	Age	Cases	Height	Age	Cases	Height	Age	Cases	Height	
	<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Years</i>	<i>Number</i>	<i>Inches</i>	<i>Years</i>	<i>Number</i>	<i>Inches</i>	
Bohemians.....	-----	-----	-----	18-19	8	65.9	18-19	20	68.1	Boas, 1911
	-----	-----	-----	20-24	33	65.1	20-24	44	67.0	
	-----	-----	-----	25+	462	66.0	25+	69	67.6	
Hebrews.....	-----	-----	-----	18-19	52	64.7	18-19	11	66.2	Gould, 1941
	-----	-----	-----	20+	762	64.6	20+	38	65.8	
	-----	-----	-----	-----	-----	-----	21.9	100	68.2	
French (Acadian)....	27.2	100	66.9	-----	-----	-----	-----	-----	-----	Lasker, 1952
Mexicans.....	35.8	100	63.7	² 47.4	30	64.7	-----	-----	-----	
	-----	-----	-----	³ 47.8	66	64.4	-----	-----	-----	
Japanese.....	35.5	171	62.4	⁴ 61.4	15	63.4	-----	-----	-----	Shapiro, 1939
Cantonese.....	27.7	97	65.2	40.6	178	62.5	26.2	188	64.1	
	-----	-----	-----	-----	-----	-----	23.0	48	66.0	Lasker, 1946

WOMEN

Bohemians.....	-----	-----	-----	16-19	30	63.4	16-19	114	63.5	Boas, 1911
	-----	-----	-----	20-24	52	62.4	20-24	62	63.6	
	-----	-----	-----	25+	609	61.8	25+	83	62.8	
Hebrews.....	-----	-----	-----	16-17	91	61.2	16-17	30	61.0	Lasker, 1952
	-----	-----	-----	18+	891	61.0	18+	67	62.4	
	-----	-----	-----	16-19	203	61.4	16-19	18	61.1	
Sicilians.....	-----	-----	-----	20-21	84	61.8	20-21	7	62.3	Shapiro, 1939
Mexicans.....	38.9	157	59.5	⁵ 42.2	23	60.4	-----	-----	-----	
Japanese.....	38.6	91	57.5	38.5	93	58.5	24.6	91	59.1	

¹ Those who never migrated.² Migrated before 17 years of age; in United States for 2 years or more.³ Migrated at 17-27 years of age; in United States for 2 years or more.⁴ Migrated after 27 years of age; in United States for 2 years or more.⁵ Migrated at various ages; in United States for 2 years or more.

Sicilians, Acadian French, Mexicans, Japanese, and Cantonese.

For men, those born in the United States generally averaged at least an inch taller than their immigrant fathers or men who had not migrated. Mexican men who migrated before they were 17 years of age, or at ages between 17 and 27 years, and stayed in the United States at least 2 years were taller as adults than relatives who remained in Mexico. Mexican men who came here after age 27 years, or Japanese who came as adults were not taller than those who never migrated. Mexican women who came here before they were 20 years old were generally as tall as those born here. However, those who came here at 20 years or over were from one-half inch to an inch shorter than those born in the United States. Goldstein (1943) found similar results with Mexican immigrant families.

Greulich (1957, 1958) compared the statures of Japanese children born in the San Francisco Bay area and measured in 1956-57 with those of native-born Japanese children of similar ages measured in

1953 and 1900. Some 1957 data on measurements of native-born Japanese prepared by the Ministry of Health and Welfare of Japan (1958) are now available. They differ only slightly from the 1953 data reported by Greulich (1958). The data (figures 34 and 35) show that although the native-born Japanese have increased in size since 1900, the American-born Japanese exceed the native-born at all ages. Ito in 1942 had shown that 135 Japanese women born and reared in the United States were 1.6 inches taller than those born and reared in Japan and were 0.8 inch taller than 125 American-born Japanese women who had been reared in Japan between the ages of 3 and 18 years. Seven children born in Japan but reared in the United States averaged as tall as those both born and reared in the United States—60.6 inches. However, some racial factor was still limiting growth, since 18-year-old American women born and reared in the United States averaged as much as 64 to 64.5 inches.

Many factors are doubtless responsible for changes in body size of the population of the United States.

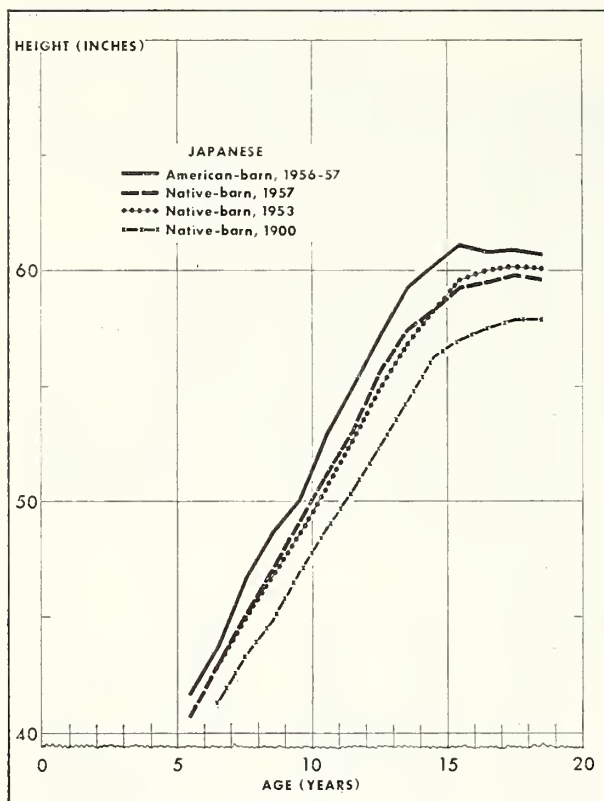


FIGURE 34.—Heights of American-born and native-born Japanese boys in 1900, 1953, and 1957.

Although there is still disagreement among scientists as to the limits of plasticity of the human organism, changes in size represent an increase under more favorable environment of the growth potential inherent in the genes (Goldstein 1943 and Kaplan 1954). Some of these environmental factors are improvement in the socioeconomic status of much of the population, improvement in medical care and sanitation, greater availability and consequent consumption of nutritious foods, and improvement in the general knowledge of nutritional needs.

Improved prenatal and infant care has greatly reduced infant mortality. Attention to the care of infants and children through periodic examinations by family physicians, pediatricians, or at well-baby or child clinics is now practiced widely. The child has better dietary direction, immunization against childhood diseases, and early detection and correction of remediable conditions. More attention is given to outdoor play, and light sanitary homes are more generally available. This better start has contributed to better development, greater size, and longer life.

A major difficulty in studies of growth and size still is separation of such factors as accelerated maturation and genetic diversification from serial changes produced by introduction of newer ethnic strains (Hunt 1958), as well as the effects of the many environmental factors.

Kluckhohn (1955) has summarized what research he considered necessary to provide an adequate description of our population here in the United States:

1. "New, genetically oriented, studies with random and adequate sampling of both time and space. This means, among other things, the use of subjects not obtained from schools and other "institutions." It also means the application of sampling techniques which take account of cultural variables."

2. "Reanalysis, on the part of many workers with varied training and interests, of the existing literature to supply:

- (a) The longest possible series on various

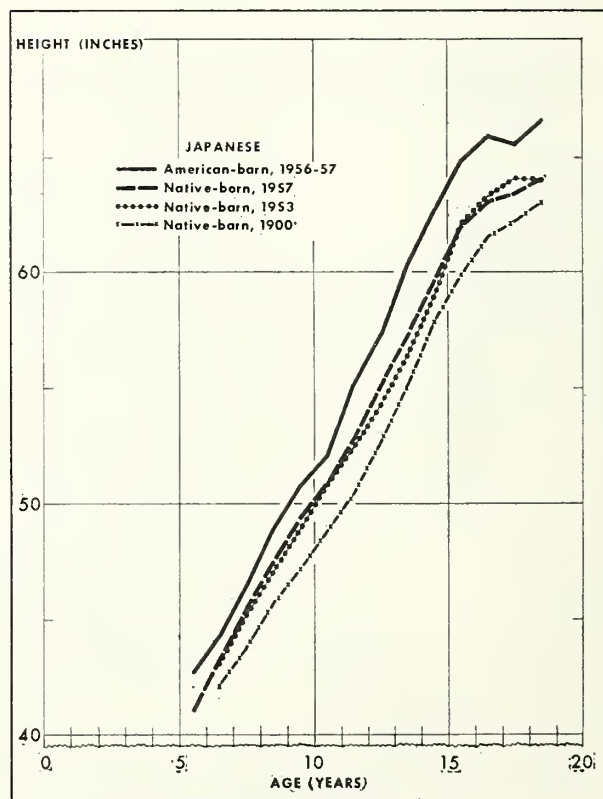


FIGURE 35.—Heights of American-born and native-born Japanese girls in 1900, 1953, and 1957.

characters in the total population that can be obtained by proper combinations of existent series;

(b) Intensive subseries on time periods; age, regional, ethnic, and class groups;

(c) Analyses that will take account of the breeding structure of the population."

3. "Attempts in every fashion that offer any

hope of success to translate materials gathered in non-Mendelian fashion into a form that will be susceptible of genetic analysis."

We hope that our attempt to summarize and evaluate both published and unpublished height-weight data may constitute a contribution toward these goals, and that it may stimulate others to carry on with the suggestions made by Dr. Kluckhohn.

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ADDENDUM—WEIGHTS FOR HEIGHTS FROM THE SOCIETY OF ACTUARIES

As this report was ready to go to press the tables of weights for heights issued by the Society of Actuaries, based on insurance data for about 5,000,000 Americans in the 1959 Build and Blood Pressure Study, were made available and are presented in tables 78 and 79. In order to compare these data on averages with the weights for heights for men and women suggested in this bulletin (table 80 inside back cover), corrections for weights of clothing and heights of heels need to be made as indicated in section I (page 2).

For men, 25 to 29 years old, weights in table 78 fall between the "median" and "high" values (50th and 75th percentiles) for the corresponding age range in table 80. The actuarial data for women in table 79 are based simply on "heights as reported" without reference to corrections for height of heels. If 2 inches are allowed for heel heights and about 3 pounds for clothing weights, the values for women

20 to 24 years old in this new table also fall between the "median" and "high" values in our table based on women in this age range. Thus, young men and women in the general population as represented in the 1959 Actuarial tables average a few pounds heavier than college students of similar ages in 1948-50. The two sets of data really agree quite well, however, since neither takes into consideration difference in body build which would allow for considerable variation for weight at a given height, and since clothing allowances for the Actuarial data are only approximate estimations.

Weights for any given height of older men in the 1959 Actuarial tables do not increase as rapidly with advancing age as do those of women. Weight differences for men 50 to 59 years old average only about 5 pounds more than for those 30 to 39 years old of the same height. Weight differences for women be-

TABLE 78.—MEN, BUILD AND BLOOD PRESSURE STUDY: *Average weights for height and age, 1959*¹

Height in inches	Weight for age—							
	15-16 years	17-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years	60-69 years
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
60	98	113	122	128	131	134	136	133
61	102	116	125	131	134	137	139	136
62	107	119	128	1 4	137	140	142	139
63	112	123	132	138	141	144	145	142
64	117	127	136	141	145	148	149	146
65	122	131	139	144	149	152	153	150
66	127	135	142	148	153	156	157	154
67	132	139	145	151	157	161	162	159
68	137	143	149	155	161	165	166	163
69	142	147	153	159	165	169	170	168
70	146	151	157	163	170	174	175	173
71	150	155	161	167	174	178	180	178
72	154	160	166	172	179	183	185	183
73	159	164	170	177	183	187	189	188
74	164	168	174	182	188	192	194	193
75	169	172	178	186	193	197	199	198
76	(²)	176	181	190	199	203	205	204

¹ Source: Society of Actuaries, 1959; weights in ordinary indoor clothing including shoes.

² Average weights omitted in classes having too few cases.

TABLE 79.—WOMEN, BUILD AND BLOOD PRESSURE STUDY: *Average weights for height and age, 1959*¹

Height in inches	Weight for age—							
	15-16 years	17-19 years	20-24 years	25-29 years	30-39 years	40-49 years	50-59 years	60-69 years
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
58	97	99	102	107	115	122	125	127
59	100	102	105	110	117	124	127	129
60	103	105	108	113	120	127	130	131
61	107	109	112	116	123	130	133	134
62	111	113	115	119	126	133	136	137
63	114	116	118	122	129	136	140	141
64	117	120	121	125	132	140	144	145
65	121	124	125	129	135	143	148	149
66	125	127	129	133	139	147	152	153
67	128	130	132	136	142	151	156	157
68	132	134	136	140	146	155	160	161
69	136	138	140	144	150	159	164	165
70	(2)	142	144	148	154	164	169	(2)
71	(2)	147	149	153	159	169	174	(2)
72	(2)	152	154	158	164	174	180	(2)

¹ Source: Society of Actuaries, 1959; weights in ordinary indoor clothing including shoes.² Average weights omitted in classes having too few cases.

tween these ages average 10 to 15 pounds, depending on their heights. The "high" weights representing the 75th percentile for men in table 80 compare well with the weights for those 40 to 49 years in the actuarial tables for men 66 inches and over, but are lower than the actuarial values for the shorter men of this age range. The "high" weights for women correspond more closely to the 30 to 39 year actuarial

weights than to those for the older women: in fact they are a few pounds less than the values for these actuarial data corrected for clothing. The ranges indicated in our table 80, therefore, may well be near the desirable weights for present day American men and women, since it is commonly recommended that weights increase little or none with advancing age.

TABLE 80.—MEN AND WOMEN: *Suggested weights for heights*

Height in inches	Weights for men			Weights for women		
	Low	Median	High	Low	Median	High
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
60				100	109	118
61				104	112	121
62				107	115	125
63	(118)	(129)	(141)	110	118	128
64	(122)	(133)	(145)	113	122	132
65	126	137	149	116	125	135
66	130	142	155	120	129	139
67	134	147	161	123	132	142
68	139	151	166	126	136	146
69	143	155	170	130	140	151
70	147	159	174	133	144	156
71	150	163	178	(137)	(148)	(161)
72	154	167	183	(141)	(152)	(166)
73	158	171	188			
74	162	175	192			
75	165	178	195			

Weights were based on those of college men 25 to 29 years old and college women 20 to 24 years old. Measurements were made without shoes and other clothing. The range from "low" to "high" at a given height included the middle 50 percent of the cases. Half the weights were below the median and half above. Body build will determine where within the ranges given normal weight should be. Weight at any age probably should not vary from these values by more than 5 pounds for the shorter adults and 10 pounds for the taller ones. Values in parentheses were extrapolated.

